Improved Performance Research Integration Tool (IMPRINT)

Tutorial

DRAFT

US Army Research Laboratory
Human Research and Engineering Directorate

Contents

Introduction

This tutorial has been created to assist first time users, especially those who are not able to attend a workshop. This tutorial assumes that you have used Window applications before and know how to get around your computer. Although the workshop is more comprehensive, we hope this tutorial will help get you started. However, if you should run into any problems do not hesitate to contact us. Please contact Ms. Celine Richer – 410-278-5883 or e-mail: cricher@arl.army.mil.

The tutorial is divided into several sections.

- ◆ Define System Mission
- ◆ Stressors & Performance Shaping Functions
- ◆ Define Soldier
- ◆ Define Equipment
- ◆ Sharing Your Analysis
- ◆ Using Library Data
- ◆ Network Tool Bar
- ◆ Decision Symbols
- ◆ PTS Impact on Tasks
- ◆ Define Equipment Exercise Data sheet
- ◆ Library Systems

Stressors & Performance Shaping Functions are used in conjunction with either Define System Mission and/or Define Equipment (in this tutorial we use them with Define System Mission).

Define Supply is used in conjunction with Define Equipment.

Define Soldier is used with both and can be used alone.

Define System Mission and Define Equipment can be used alone, although it is suggested that you select MOSs before you begin to create your tasks.

Using Library Data, Network Tool Bar, Decision Symbols, PTS Impact on Tasks, Define Exercise Data and Library Systems are references.

- ❖ Using Library Data is an explanation of how to use one of IMPRINT's existing library models.
- ❖ The Network Tool Bar and Decision Symbols sections both explain the different icons/symbols you will see and use in IMPRINT.
- ❖ PTS Impact on Tasks are tables that show which taxons are impacted taxons.

❖ Define Equipment Exercise Data sheet is used during the Define Equipment part of this tutorial.

❖ The Library Systems section is a table of analyses within IMPRINT, which can be used as a starting point.

This tutorial is meant to be an aid and cannot answer all your questions. It's meant to be used in conjunction with the Users Guide and the Analysis Guide. You will find both in your "Documentation" folder under your IMPRINT folder.

If you have any suggestions regarding this tutorial or any problems using it please let us know. We want to make this a useful tool that will help you to use IMPRINT effectively.
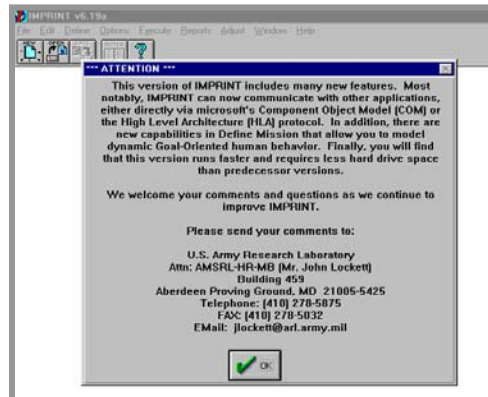
Happy IMPRINTing……😊
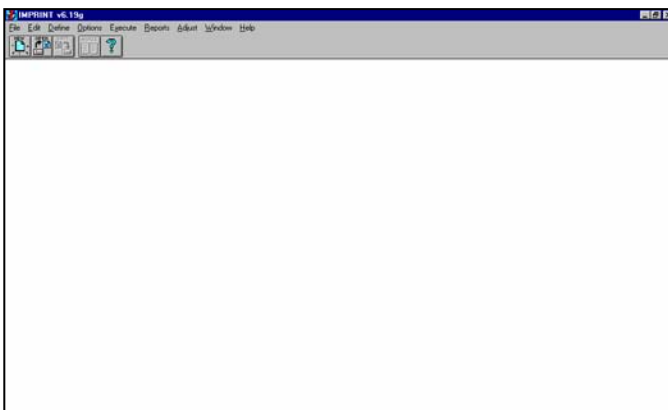
Starting IMPRINT

To start IMPRINT go to Start/Programs/IMPRINT.
Whenever you start IMPRINT you will see the following screen.

Next, you will see the following message screen.

Select OK and you will then see the Main screen. It is blank…..

At this point, you can either create a new analysis or modify an existing one.

Define System Mission

In this section, you will go through the steps to create a new system mission. For this exercise you will create a VACP model. VACP stands for **V**isual/**A**uditory/**C**ognitive/**P**sychomotor. You will learn how to create a new analysis, open an existing analysis, save your analysis, and also execute the model you create. You will also learn how to look at reports generated by the executed model and save them. For more information on VACP models see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your IMPRINT folder.
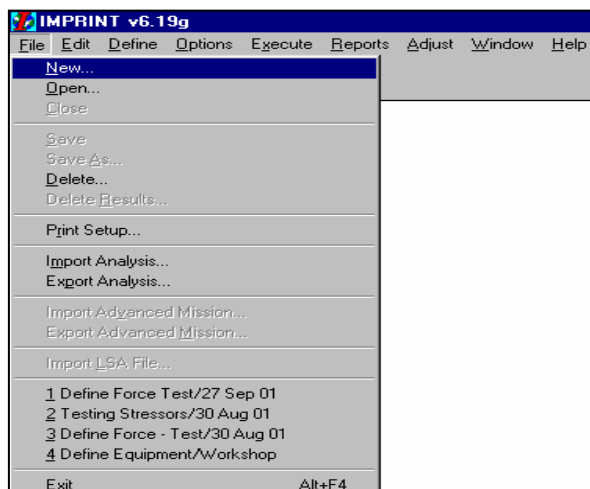
Let's start by creating a new analysis.

Creating a New Analysis
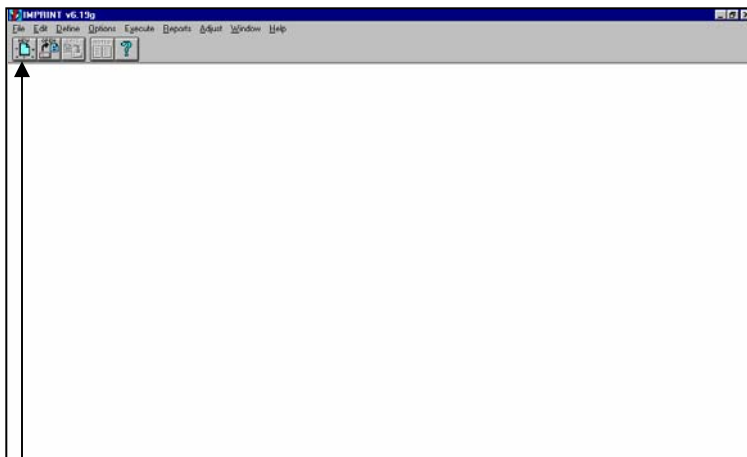
"New" button

Create a new analysis by either selecting the "New" button as shown above or File/New menu as shown below

Define System Mission Exercise

On the <u>Create A New Analysis</u> screen -
Enter the "Analysis Name" and "Analysis Version".

Analysis Name = **VACP Exercise**
Analysis Version = **Tutorial**

If you want to make some notes you can enter
information in the "Description" field.
When finished select "OK".
Now you are ready to make your modifications.

> ***Note:*** If you need to model a system that is similar to one of IMPRINT's library models see "**Using Library Data**" at the end of this tutorial.

After selecting "OK" you will see the <u>Main</u> screen, but now, in the title bar above the main menu after "IMPRINT v" #, you will see Analysis: and the name and version of the open analysis.
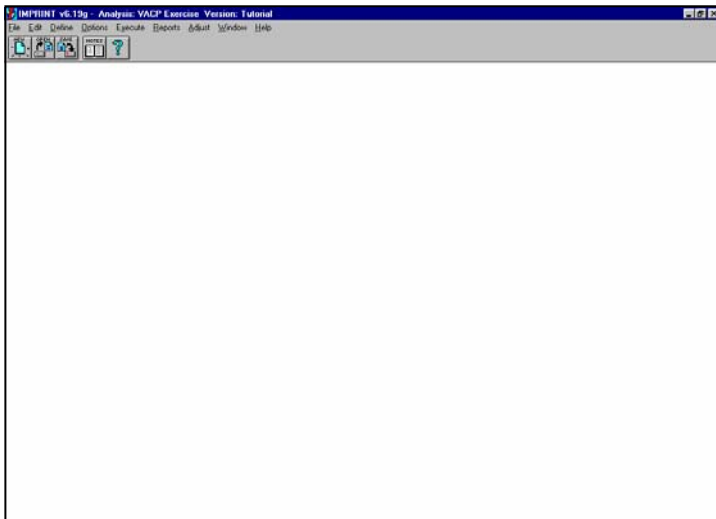
Define System Mission Exercise
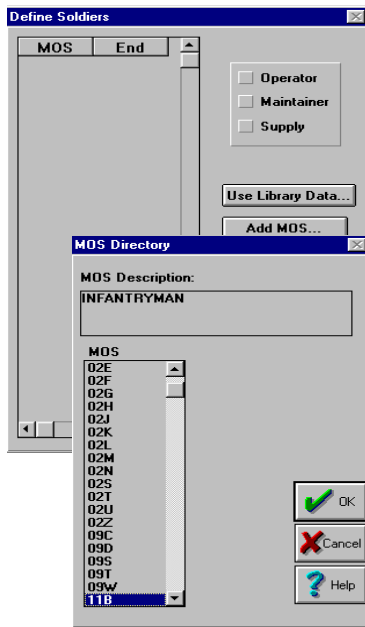
Select Define/Soldiers… from the menu bar.
> ***Note:*** This is not necessary. If you do not select a MOS(s) for your operator(s), IMPRINT will assign default MOS 00A. However if you need to apply Personnel Characteristics and you have not assigned a MOS(s) to your operator(s), you will need to come back to your mission and assign them. For this tutorial you will need MOS assignments when you do the **P**ersonnel Characteristics/**T**raining Frequency/**S**tressors (PTS Option) section.
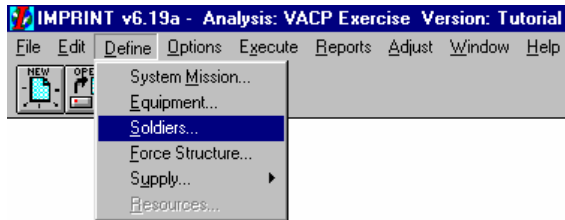
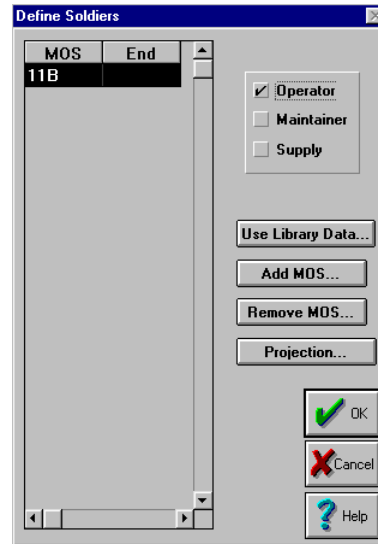Select "Add MOS…"
Select MOS 11B from the MOS Directory.
Select "OK"   Automatically selects   "Operator"

If you had selected an MOS that was designated as a Maintainer on the <u>MOS Directory</u> screen, then IMPRINT would have selected Maintainer on the <u>Define Soldier</u> screen. There may be cases when the Operator and Maintainer will be the same person. In this case, you as the analyst would select another. In other words if you select a MOS that by default is an Operator, you would also select Maintainer. This would allow you to use the same MOS on the operator and maintainer side of IMPRINT.

Define System Mission Exercise

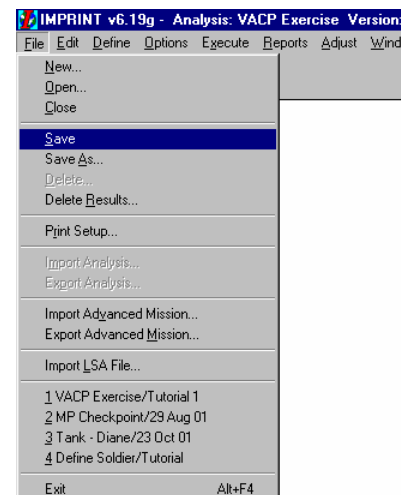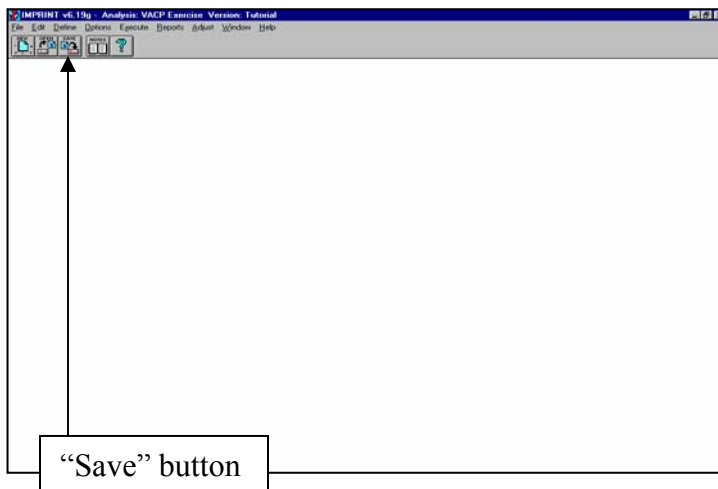Select "Add MOS…". Select the second MOS (13E). Select OK. "Operator" automatically selected.
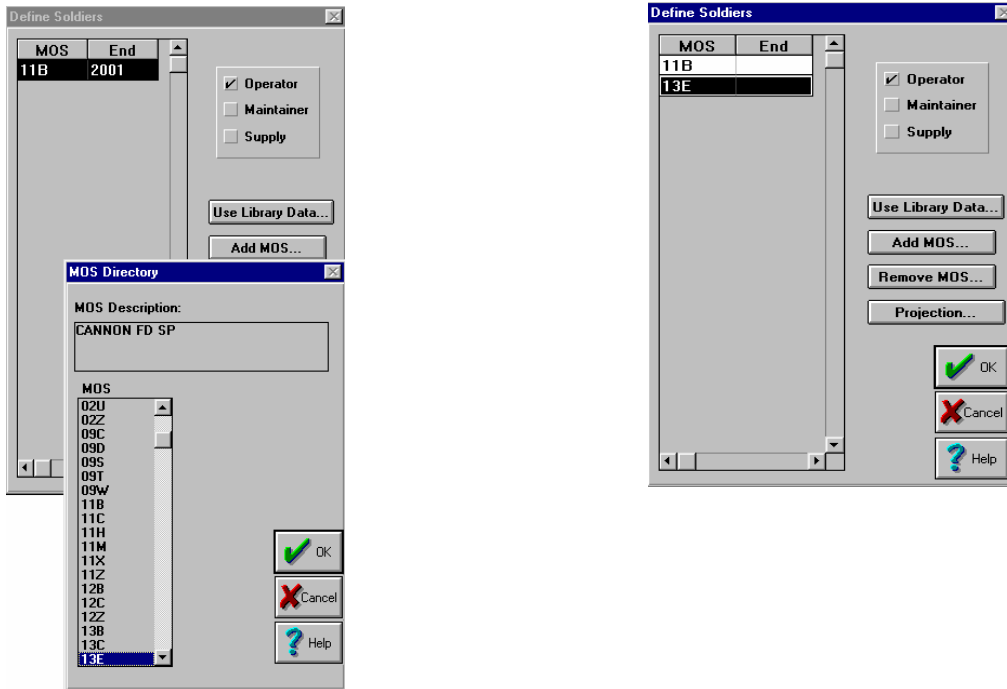
To save your selections, select "OK" on the <u>Define Soldiers</u> screen.

Now you are back to the <u>Main </u>screen

Saving your work

Select the "Save" [SAVE] button   or select File/Save from the menu to save
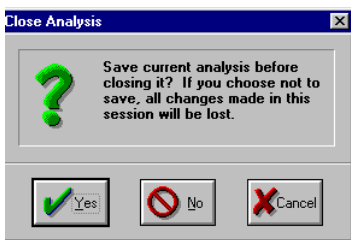your analysis.

This will save what you have done so far. It's a good idea to save your work every so often; we recommend every 20 minutes. In this exercise we will exit IMPRINT and then go back and open the analysis. Normally after saving you would continue to the next step in creating/modifying your analysis.

Exit IMPRINT by selecting File/Exit from the menu.
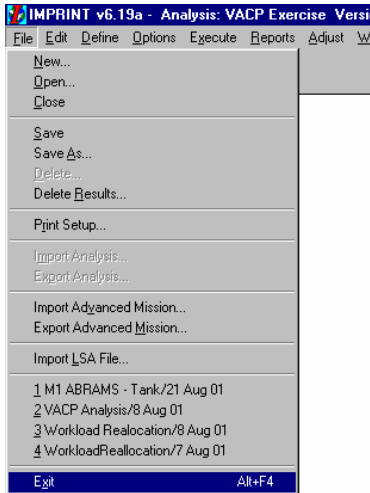
If you had not already saved you would see the Close Analysis screen asking you if you want to save the changes you made.
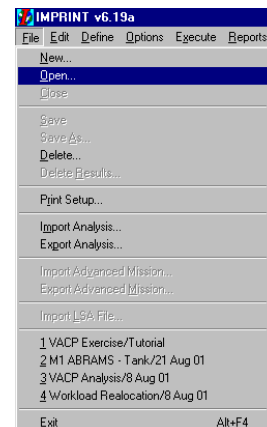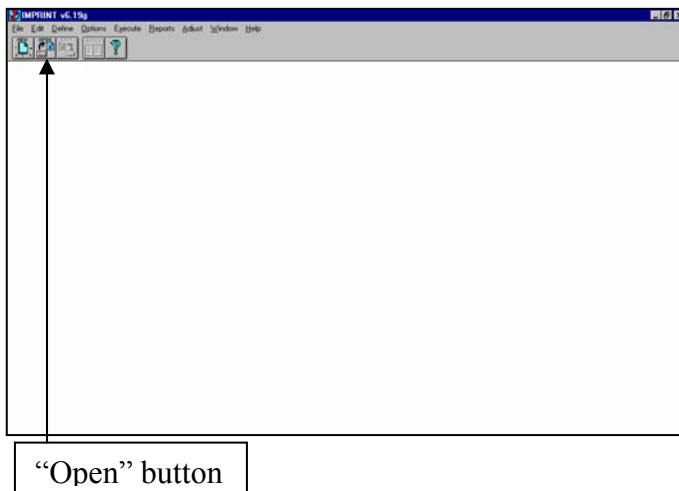

Select "Yes". Your analysis will be saved and then IMPRINT will close.

Start IMPRINT and open your analysis.
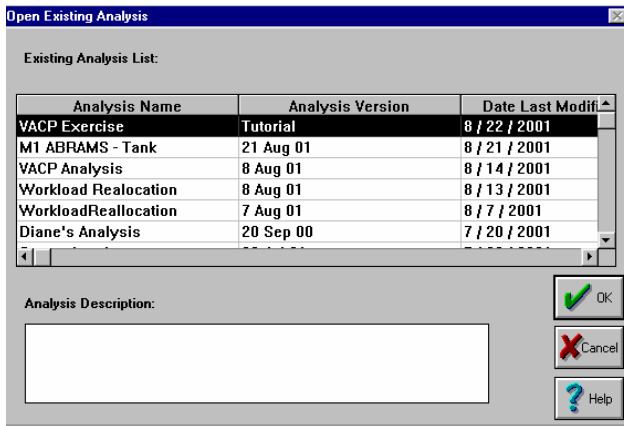
Open an Existing Analysis

You can use the "Open" button or   select File/Open from the menu bar..

"Open" button

Define System Mission Exercise

You will see the <u>Open Existing Analysis</u> screen. Highlight the analysis you want to open and select "OK". This will open your analysis

Select "Define/System Mission…" from the menu.
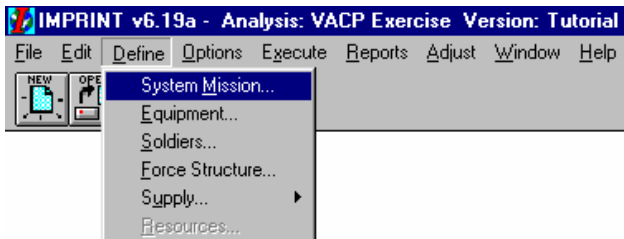
Select "Add…" and enter the "Mission Name".
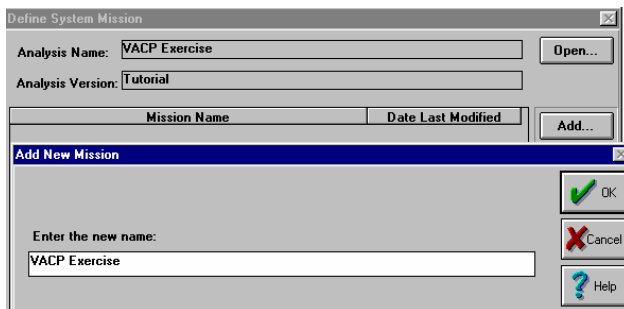
Mission Name = **VACP Exercise**
Select "OK"

Select "Open" – This will open your mission.

Note: The "Mission Name" will now appear in the title bar along with the name and version of the open analysis.

Define System Mission Exercise

On the <u>Mission Information</u> screen - enter the mission description and mission data.
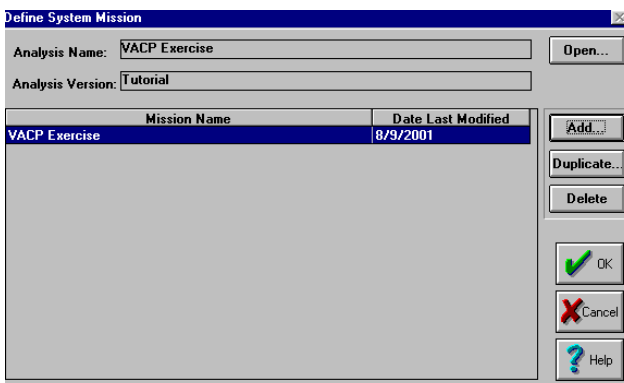
> ***Note:*** The time format generally used in IMPRINT is **HH:MM:SS.dd**

Mission Description = **This is a demonstration for IMPRINT tutorial**

Time Standard = **00:30:00.00**

Time Criterion = **75.00**

Accuracy Criterion = **80.00**

Mission Criterion = **75.00**

> ***Note:*** You don't need this information to execute your analysis. However, if you make changes to your model and want to compare the overall results of a new mission with this one, the results can be compared to the standards and criteria you enter here. In the "Mission Summary" report, you will see a summary of how often the standards and criteria were met.

At the beginning of this exercise, we said this would be a VACP model. When you create an analysis, the default is always "VACP Workload Analysis". You must select the other two options ("Goal Orientation", "Advanced Workload Analysis"). Neither of these options is covered in this tutorial at this time. For an explanation of these options, see the <u>IMPRINT Users Guide</u>.

When finished entering the information on this screen, you will enter the crewmembers (operators) for your model.

Select "Crew" to add crewmembers. You will see a default crewmember. To change the default name, click in the box and use the "Backspace" to delete. Enter the new name.
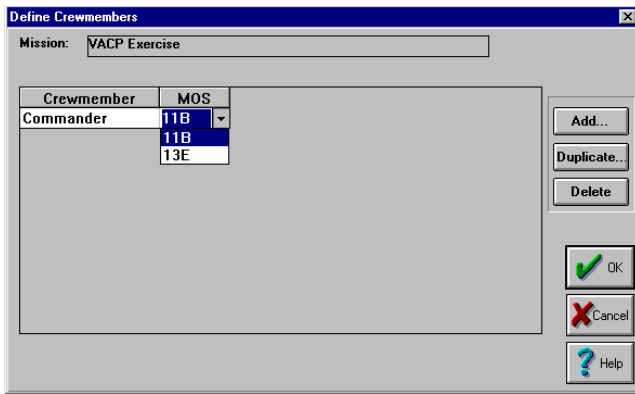
Type in – **Commander**

Define System Mission Exercise
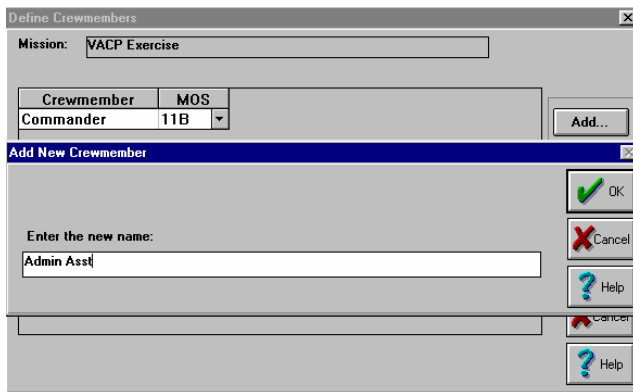
Select an MOS – **11B**

To add the other 2 crewmembers select "Add…".
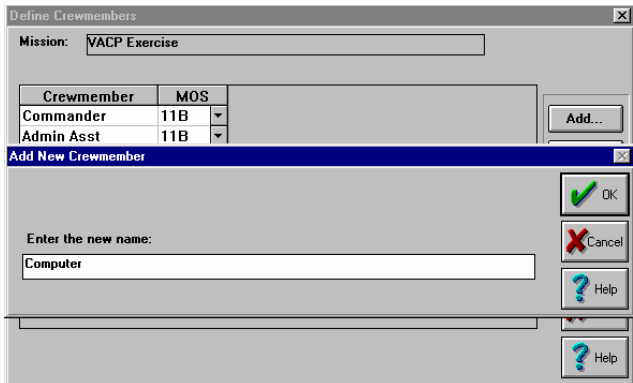
Enter – **Admin Asst**, select "OK".
Select MOS – **11B**

Select "Add" again and enter the last crewmember
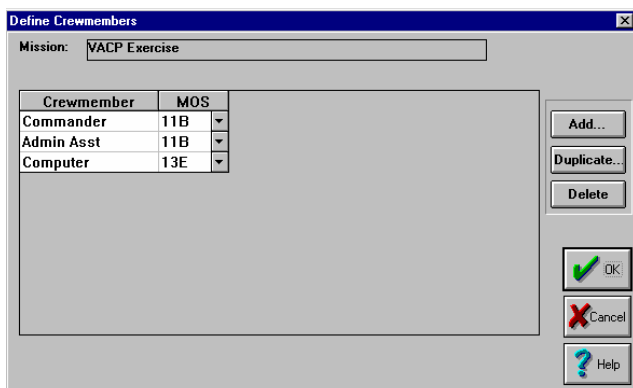
Enter – **Computer**, select "OK".
Select MOS – **13E**
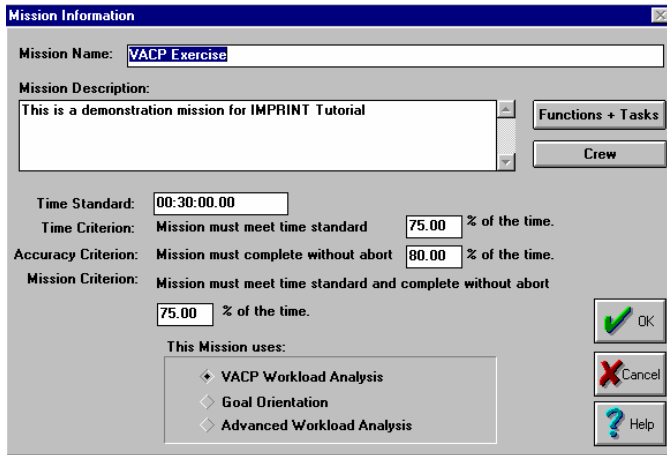
Define System Mission Exercise
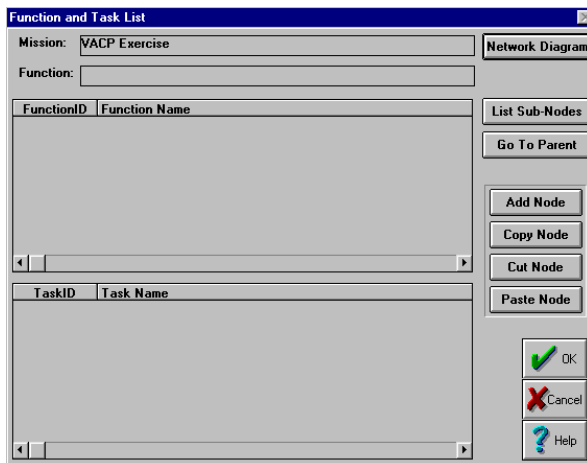
After you have entered all 3 crewmembers select "OK". This will take you back to the
<u>Mission Information</u> screen

From the <u>Mission Information</u> screen, select – "Functions+Task".
On the <u>Function and Task List</u> screen select – "Network Diagram"

Creating the Network Diagram.

To create the network diagram you will use several tools.

You will use the:

"Function" [icon] tool to add functions and the "Task" [icon] tool to add tasks.

"Select" [icon] tool to move the nodes, double click on nodes to open them, and manipulate the horizontal
and vertical scroll bar.

"Path" [icon] tool to draw your paths. To draw your path, click in the center of the function or task
where the path will originate. Hold the mouse button down and drag to the center of the function where
the path will end and release the mouse button.

Define System Mission Exercise

If you draw a path to the wrong node use the "Undo" [icon] tool to undo your path. Use it as you would the "Path" tool. Retrace the incorrect path and then use the "Path" tool to draw the correct one.

Whenever you draw a path to more than one node you will get a "Probabilistic" [P icon] symbol.

For more information on the other Network tools and symbols see the "**Network Tool Bar**"(page 75) and "**Decision Symbols**" (page 77) sections at the end of this tutorial.

Function Network

Let's begin creating the network at the function level.
Before you begin adding your functions, use the "Select" tool, click and hold on the "END" node and move it to the opposite side of the network screen to allow 4 functions to fit between the "START" and "END" nodes. This is not necessary. We are doing it here for clarity.
        Note: Functions/Tasks are placed in closest empty spot to the cursor.

To use the Function tool, click on the function symbol. Your cursor will change to the shape of the function tool.
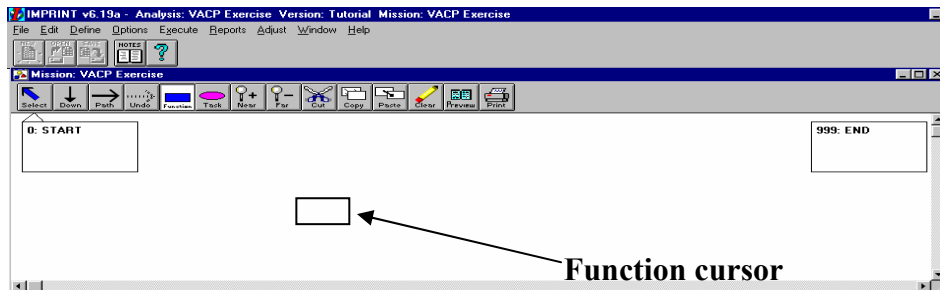
Create the 5 functions by clicking in the network box where you want the functions to be. See below. If you don't like where you have placed a function, use the "Select" tool to move it.
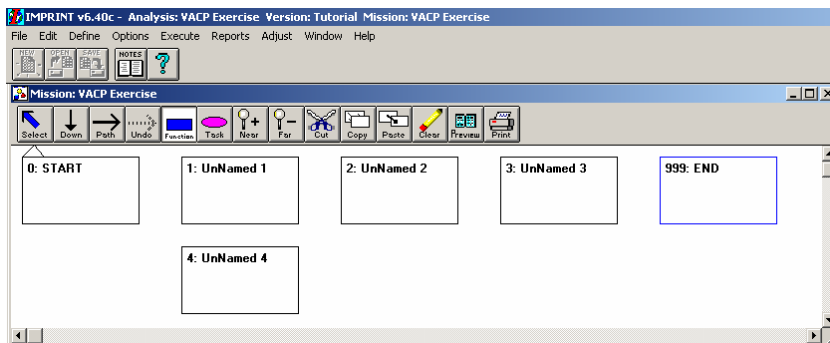
Now begin drawing your paths.
Select the "Path" tool. Notice that your cursor now changes and looks like an arrow. (⟶)
Connect START to UnNamed 1
To draw a path from one node to another in this case from START to UnNamed 1 do the following:
    Hold your left mouse button down and begin in the center of the node you are coming from -in this case the START function and drag your arrow cursor to the center of the node you are going to – in this

case UnNamed 1 and release the mouse button. If you did this correctly you will see a line drawn from START to UnNamed1 with the arrow pointing to UnNamed1.

Now using the same procedure, connect the others.
Connect START to UnNamed 4

Connect UnNamed 1 to UnNamed 2

Connect UnNamed 2 to UnNamed 3

Connect UnNamed 3 to END

Connect UnNamed 4 to END

The function UnNamed 4 will be repeated during this mission. The make it a repeat function:
    Use the path tool and place your cursor inside UnNamed 4. Now click inside UnNamed 4.
    This will draw the path back to node UnNamed 4.

When you are finished your network should look like the one below.
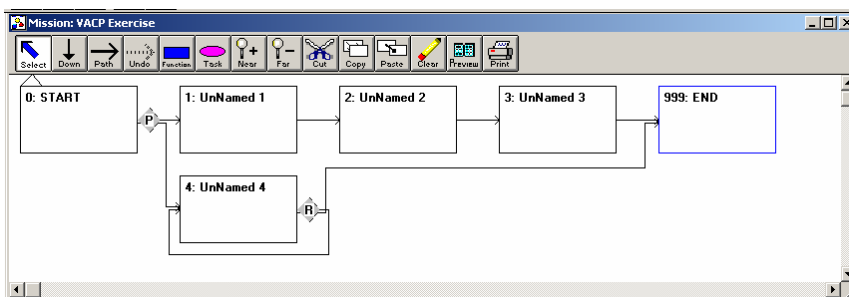
When you connect START to UnNamed 1 and to UnNamed 4 you will see the "Probabilistic" symbol. In this exercise, this is intended to be a "Multiple" node because both functions UnNamed 1 and UnNamed 4 will begin to execute simultaneously and then rejoin at "END".

Using the "Select" tool, double click on the "Probabilistic" symbol coming from the START node.
    Note: The "Select" tool can be used on all Functions, Tasks, and Decision nodes to enter or change other characteristics of that node. This is accomplished by double clicking.

You should see this:
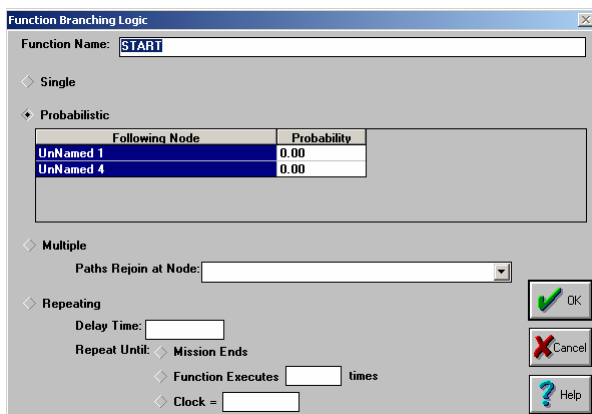
Define System Mission Exercise

Select "Multiple" and using the drop down box select the END node. Then select "OK".

UnNamed 4 is a "Repeating" ◇R= function. Depending on how you drew your paths it may have a "Probabilistic" symbol. Double click on the ◇P= or ◇R= symbol. If the symbol is "Probabilistic you will see this screen. Select "Repeating" and then enter the "Delay Time" as shown on this screen -

If the symbol is Repeating ◇R= then you will see this screen. In either case – when this function begins it will have a delay of 30 seconds and will continue to execute until the mission ends.

Delay Time = **00:00:30.00**
"Repeat Until" - **Mission Ends**.
Select "OK".

Your network diagram should now look like this:
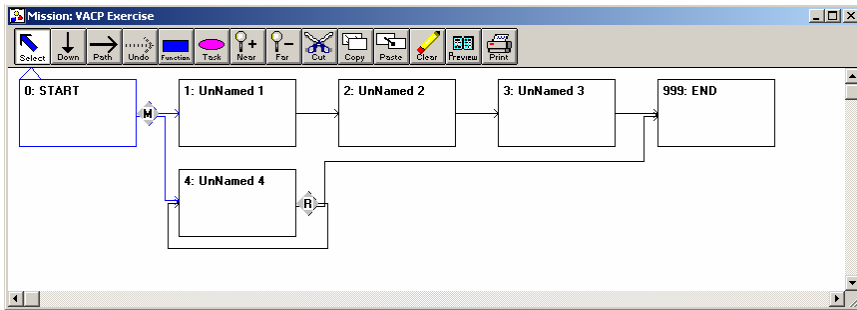
Now would be a good time to save your work.

Select File/Full Permanent Save (network plus data) from the main menu
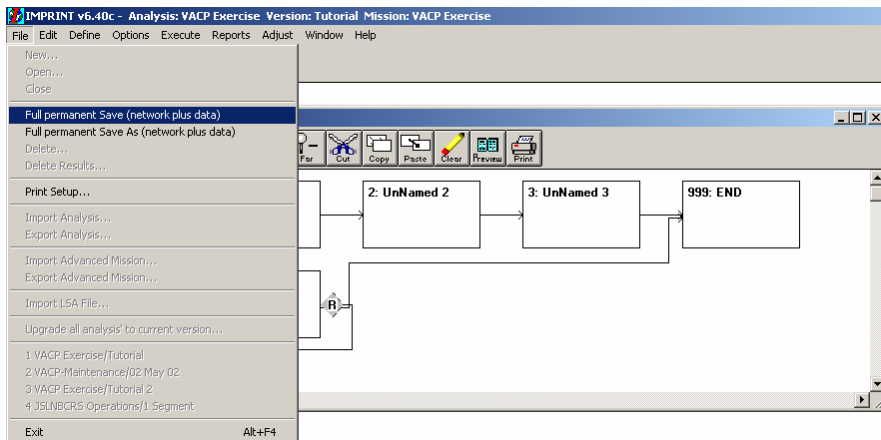
You will see a dialog box come up asking if you want save your diagram with their task and function information.
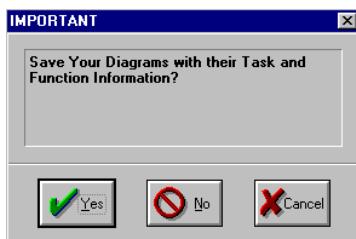
Select "Yes"

During the process of creating this network, do this every so often so you don't loose your work.

You can now begin renaming the functions and entering function data.
The function data is not necessary to execute your model but if you want to make comparisons at the function level this is where you would enter the data.

Define System Mission Exercise

Double click on function "UnNamed 1". Remember the time format is HH:MM:SS.dd

Name = **Monitor Display**
Time Standard = **00:01:00.00**
Criterion = **80.00**
Select "OK" or select "Next".

If you select "OK" you must double click on the next function you want to modify. If you select "Next" you will automatically go to the next function. For example you just finished modifying function 1. However, after you created your network you decided that function 3 should execute after function 1 and function 2 should execute after function 3 and that is how your network flows. When you select "Next" the functions will advance in chronological order, even if they do not execute in chronological order.

Here is the information you need to complete the remaining functions.

"UnNamed 2"	"UnNamed 3"	"UnNamed 4"
Name = **Evaluate Data**	Name = **Direct Action**	Name = **Communicate**
Time Standard = **00:01:00.00**	Time Standard = **00:01:00.00**	Time Standard = **00:01:00.00**
Criterion = **80.00**	Criterion = **80.00**	Criterion = **80.00**

When finished entering the data for each function select "OK". This will take you back to the function network model.
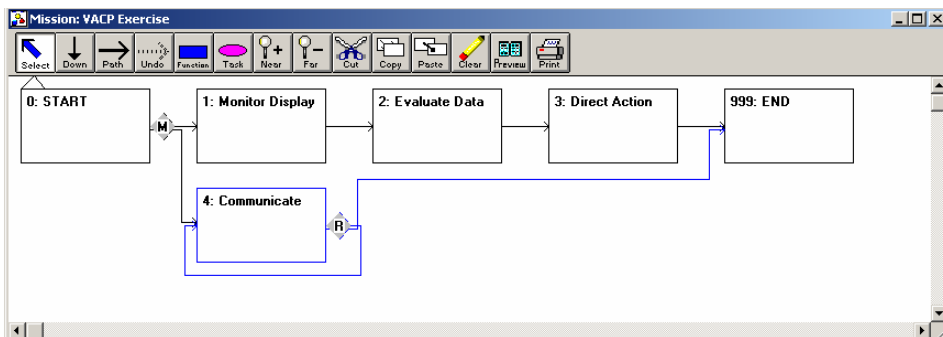
Select "File/Full permanent save (network plus data)" to save your work. You will now begin to enter tasks for each function.

Define System Mission Exercise

Task Network

For the purpose of this exercise you will enter all the data at one time. However, when you initially create your model, we suggest you begin by entering only the mean time. Then execute your model to ensure that your paths are connected properly. If it executes without any errors you can then add more data. For instance, complete the Time&Acc tab for all the tasks and execute again. If that looks good then enter failure information, if appropriate, and execute your model again. It's easier to find a problem if you add data incrementally. If all is running smoothly then you can add more data. If after adding more data you begin having problems it will be easier to backtrack and find the problem.

Let's begin creating the network at the task level.

To create the task network - select the "Down" [↓ Down] tool and click on the function **Monitor Display** to get to its task level. Create the task network.

Use the "Task" [⬭ Task] tool to add tasks. Then use the "Path" tool to draw your paths.
Connect START to UnNamed 1 and to UnNamed 2
Connect UnNamed 1 to UnNamed 2
Connect UnNamed 2 to END
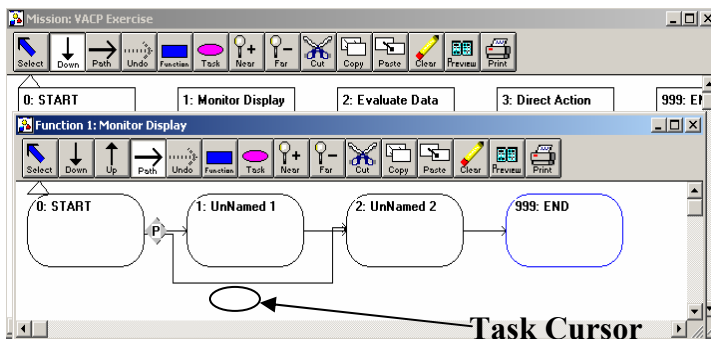
Double click on the "Probabilistic" symbol [P] and enter the following information:

Probabilistic: UnNamed 1 = **0.80**
UnNamed 2 = **0.20**

When finished – select **OK**

Define System Mission Exercise

Double click on "UnNamed 1"

Replace UnNamed 1 with **Resize and reorganize display elements** in the "Name" field

Now select the "Next >" button and this will take you to the task UnNamed 2.
Name this task: **Read information**

Now select the "< Previous" button and this will take you back to **Resize and reorganize display elements.**
On the *Time&Acc* tab enter the following information:
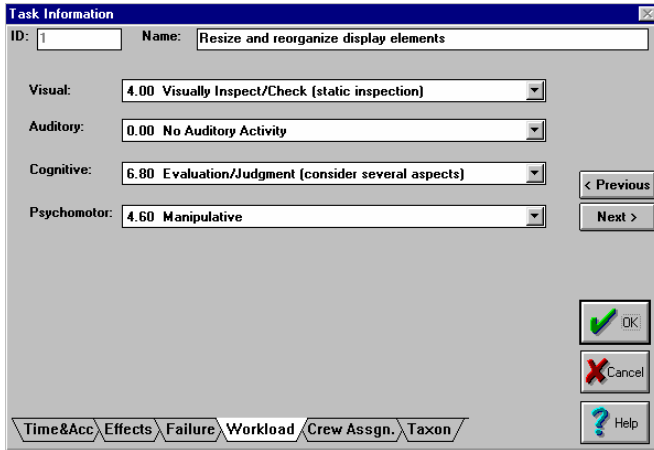
Time Standard = **00:01:00.00**
Accuracy Standard = **73.59**
Criterion = **80.00**
Mean Time = **00:00:30.00**
Time StDev = **00:00:10.00**
Mean Accuracy = **50.00**
Accuracy Standard Deviation = **5.00**

Select the *Failure* tab and enter the following information:

1) Task
   "Read Information" is degraded **10.00** %
       Time = **20.00** %
       Accuracy = **20.00** %
2) Task
   "Resize and reorganize display elements"
   follows   **65.00** %
3) Mission fails =   **5.00** %
4) No effect =   **20.00** %

"Total Probability" must equal   100.00%

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Define System Mission Exercise
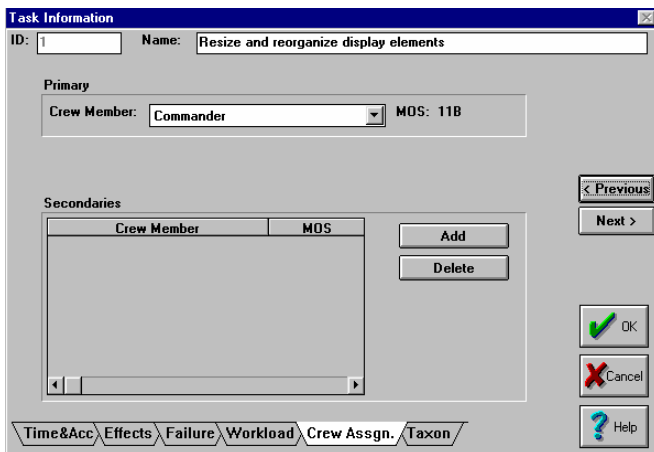
Select the *Workload* tab and enter the following information:

Visual = **4.00**
Cognitive = **6.80**
Psychomotor = **4.60**

Select the *Crew Assgn.* tab and enter the following information:
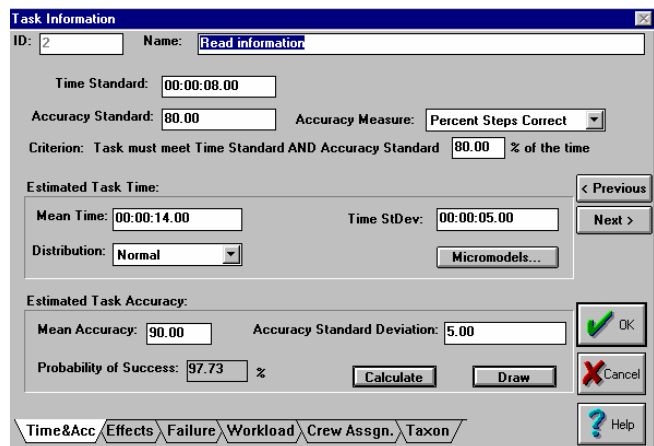
Primary Crew Member = **Commander**

When finished entering the Crew Assgn. information, select "Next" and to go to the next task.
Task Information for – **Read information**

Enter *Time&Acc* tab information:

Time Standard = **00:00:08.00**
Accuracy Standard = **80.00**
Criterion = **80.00**
Mean Time = **00:00:14.00**
Time StDev = **00:00:05.00**
Mean Accuracy = **90.00**
Accuracy Standard Deviation = **5.00**

Define System Mission Exercise

Enter *Failure* tab information.

3) Mission fails =   **10.00** %

4) No effect =   **90.00** %

"Total Probability" must equal 100.00%

Enter *Workload* tab information.
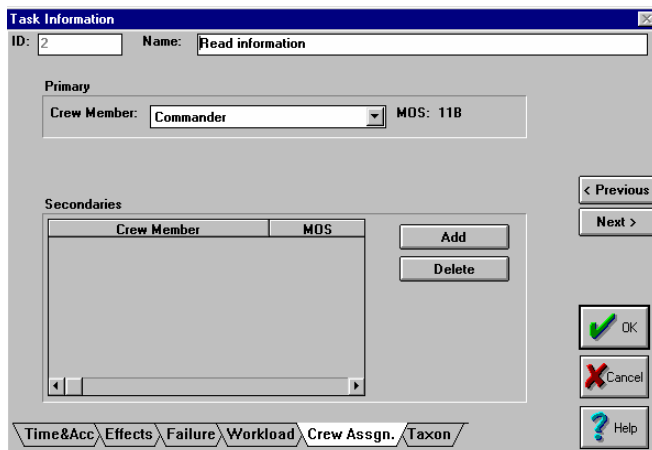
Visual = **5.90**
Cognitive = **5.30**

Enter *Crew Assgn.* tab information.

Primary Crew Member = **Commander**

You have now completed entering the task network and task information for the first function. Select "OK" to get back to task network.

Define System Mission Exercise
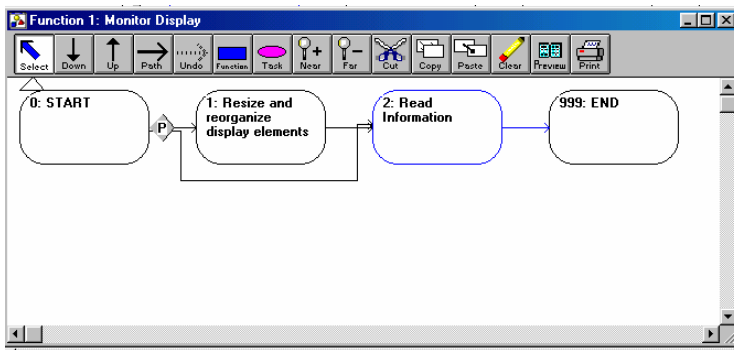
This may be a good time to save your analysis. Select "File/Full Permanent Save (network plus data)" from the main menu.

After saving your analysis, you can use the "Up" tool to get back to the function level.

Use the "Down" tool and begin creating the task network for function **Evaluate Data.**
Use the "Task" tool and create the network. This function has one task.
Connect "START" to UnNamed 1
Connect UnNamed 1 to "END"

Task Information for "UnNamed 1".

Time&Acc tab	*Failure* tab	*Workload* tab	*Crew Assgn.* tab
Name = **Interpret data**	Mission fails = **5.00**	Visual = **5.00**	Crewmember = **Commander**
Time Standard = **00:00:20.00**	No effect = **95.00**	Cognitive = **6.80**	
Accuracy Standard = **85.00**			
Criterion = **85.00**			
Mean Time = **00:00:15.00**			
Time StDev = **00:00:05.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			
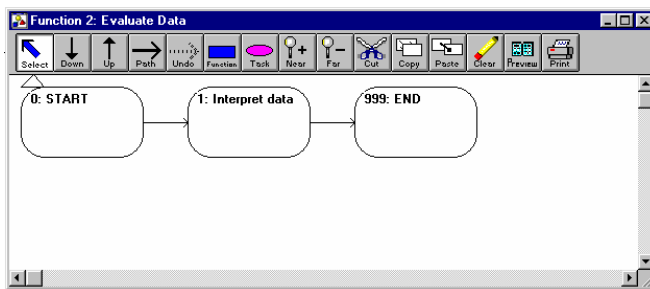
When finished select "OK" and get back to the function level.

Use the "Down" tool and begin creating the task network for function **Direct Action**
Use the "Task" tool and create the network. This function has 3 tasks.
Connect "START" to UnNamed 1 and UnNamed 2
Connect UnNamed 1 to UnNamed 3
Connect UnNamed 2 to UnNamed 3
Connect UnNamed 3 to "END"

Define System Mission Exercise

Double click on UnNamed 1
Replace UnNamed 1 with **Send electronic message** in the "Name" field

Now select the "Next >" button and this will take you to the task UnNamed 2.
Name this task: **Speech Message**

Select the "Next >" button again and this will take you to the task UnNamed 3.
Name this task: **Report**
Select the "Next >" one more time and this will take you back to the first task, **Send electronic message**.
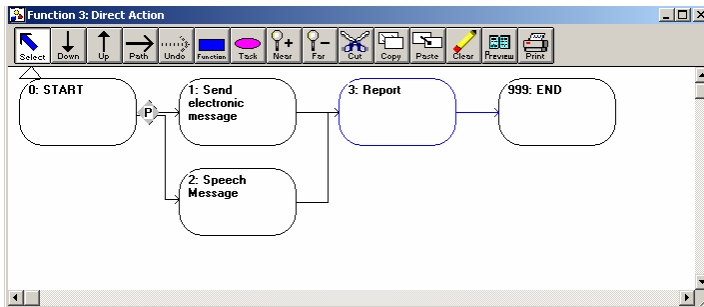
Probabilistic ⓟ -
Send electronic message = **0.50**
Speech message = **0.50**

Task Information for "Send electronic message".

Time&Acc tab	*Failure* tab	*Workload* tab	*Crew Assgn.* tab
Time Standard = **00:00:45.00**	Task "Send electronic message" follows = **20.00**	Visual = **5.90**	Crewmember = **Commander**
Accuracy Standard = **80.00**	No effect = **80.00**	Auditory = **1.00**	
Criterion = **85.00**		Cognitive = **5.30**	
Mean Time = **00:00:24.00**		Psychomotor = **7.00**	
Time StDev = **00:00:05.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			

Task Information for task – "Speech Message"

Time&Acc tab	*Failure* tab	*Workload* tab	*Crew Assgn.* tab
Time Standard = **00:00:15.00**	Task "Speech Message" follows = **80.00**	Auditory = **4.30**	Crewmember = **Commander**
Accuracy Standard = **80.00**	No effect = **20.00**	Cognitive = **5.30**	
Criterion = **85.00**		Psychomotor = 1.**00**	
Mean Time = **00:00:10.00**			
Time StDev = **00:00:02.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **10.00**			

Define System Mission Exercise

Task Information for task – "Report"

Time&Acc tab	Failure tab	Workload tab	Crew Assgn. tab
Time Standard = **00:00:30.00**	Task "Report" follows = **10.00**	Auditory = **4.90**	Crewmember = **Commander**
Accuracy Standard = **80.00**	No effect = **90.00**	Cognitive = **6.80**	
Criterion = **85.00**		Psychomotor = 1**.00**	
Mean Time = **00:00:17.00**			
Time StDev = **00:00:50.00**			
Mean Accuracy = **95.00**			
Accuracy Standard Deviation = **5.00**			

When finished go back to the function level.
Use the "Down" tool and begin creating the task network for function **Communicate**
Use the "Task" tool and create the network. This function has 3 tasks.

Connect "START" to UnNamed 1, UnNamed 2 and UnNamed 3
Connect UnNamed 1 to "END"
Connect UnNamed 2 to "END"
Connect UnNamed 3 to "END"

Double click on UnNamed 1
Replace UnNamed 1 with **Listen - Radio** in the "Name" field

Now select the "Next >" button and this will take you to the task UnNamed 2.
Name this task: **Read – Hard Copy**

Select the "Next >" button again and this will take you to the task UnNamed 3.
Name this task: **Speak**
Select the "Next >" one more time and this will take you back to the first task, **Listen - Radio**.
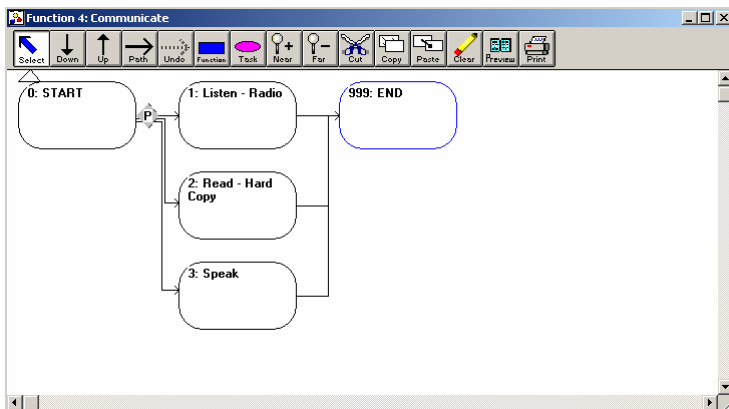
Probabilistic ⓅⓅ -
Listen – Radio = **0.33**
Read – Hard Copy = **0.33**
Speak = **0.34**

Define System Mission Exercise

Task Information for task "Listen - Radio"

Time&Acc tab	*Failure* tab	*Workload* tab	*Crew Assgn.* tab
Time Standard = **00:00:10.00**	Task "Listen - Radio" follows = **100.00**	Auditory = **4.90**	Crewmember = **Commander**
Accuracy Standard = **80.00**		Cognitive = **5.30**	
Criterion = **85.00**			
Mean Time = **00:00:06.00**			
Time StDev = **00:00:02.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			

Task Information for task "Read – Hard Copy"

Time&Acc tab	*Failure* tab	*Workload* tab	*Crew Assgn.* tab
Time Standard = **00:00:10.00**	Task "Read – Hard Copy" follows = **90.00**	Visual = **5.90**	Crewmember = **Commander**
Accuracy Standard = **80.00**	No effect = **10.00**	Cognitive = **5.30**	
Criterion = **85.00**		Psychomotor = **4.60**	
Mean Time = **00:00:07.00**			
Time StDev = **00:00:02.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			

Task Information for task "Speak"

Time&Acc tab	*Failure* tab	*Workload* tab	*Crew Assgn.* tab
Time Standard = **00:00:20.00**	Task "Speak" follows = **100.00**	Auditory = **4.30**	Crewmember = **Commander**
Accuracy Standard = **80.00**		Cognitive = **5.30**	
Criterion = **85.00**		Psychomotor = **1.00**	
Mean Time = **00:00:13.00**			
Time StDev = **00:00:02.00**			
Mean Accuracy = **90.00**			
Accuracy Standard Deviation = **5.00**			

You may have noticed you did not enter any information under the "Taxon" tab. This will be discussed in the "Stressors & Performance Shaping Function Exercise" section of this tutorial.

Save your analysis and close the Network windows. When asked if you want to save your diagram with their task and function information – select "Yes".

Execute mission

To execute your mission select "Execute/Operations Model…"
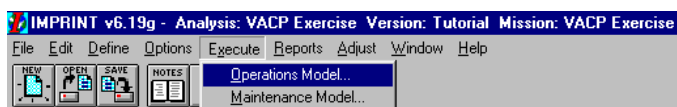
On the Execute Operations Model screen, enter the number of times you want to run the mission and a random number seed. For this exercise we will select "Animation". You may select to run the mission model with or without animation. If you check "Animation," a schematic of your network will be

displayed when the mission model is running. Current functions or tasks being executed will be indicated with black nodes.
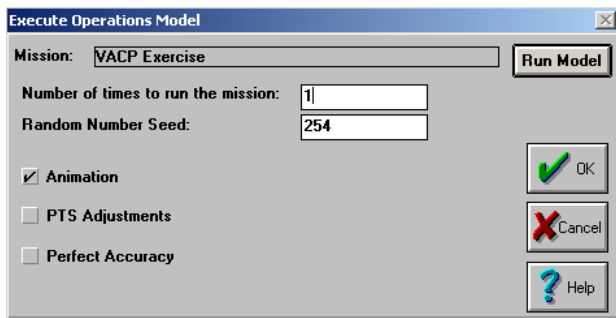
Number of time to run the mission = **1**
Random Number Seed = **254**
Select "Run Model"

Since we selected "Animation", you will see a screen similar to the following screen. However, since this model is a short one, the screen will flash by. You may only see a processing screen and then a report message. However, if your analysis is long enough and you only see the processing message screen, hit Alt/Tab. This will bring you to the animation screen. Once the model is finished executing, you will see the <u>Execute Operations Model</u> screen and then the report message.
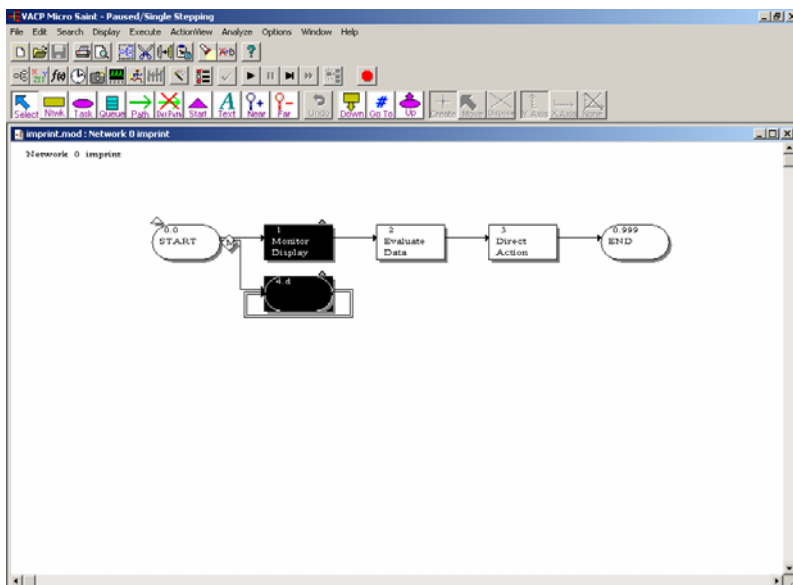
When your model is finished executing, you will get a dialog box informing you that you may view your reports by using the menu option "Reports/Operations Model Results…"

23
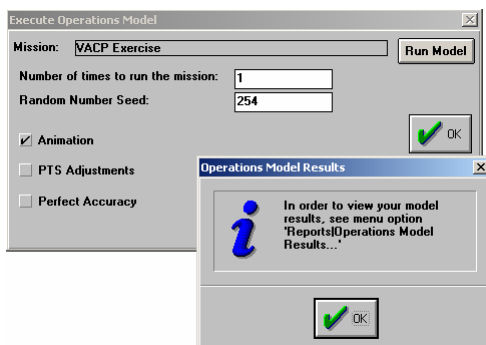
Select "OK" to close the "Operations Model Results" pop-up box and then select "OK" to close the
<u>Execute Operations Model</u> screen.

Accessing Reports.

Select "Reports/Operations Model Results…" from the menu.

Select "Mission Performance" and then select "Reports"

    Note: When you are looking at a report, if there are several pages, you can navigate through the report by using the arrows identified below.

If you want a copy of the report you can print it by selecting the "Printer" ⬛ icon or save the report by selecting the icon that looks like an envelope 🔻 .

Printing Reports

If you decide to print the report, you will get the following dialog box. You can choose to print all the pages or select how many pages you want to print. Select "OK" and your report will print to your default printer.

Saving Reports

If you want to save the report(s), select the envelope icon. When you see the following <u>Export</u> screen, select the file format. In this example, "the format selected is Word for Windows document". The destination defaults to "Disk file". Don't change it. Then select OK.

Define System Mission Exercise

You will then see the following screen. In this example, the default folder is "c:\windows\temp". You can select another drive and/or another folder. For the "Mission Performance" report, the default filename is "missperf.doc". If you intend to save several iterations of this report you should rename it, otherwise it will be overwritten the next time you execute your model. Filenames for IMPRINT follow the old DOS format. The filename must be less than or equal to 8 characters (missperf) and the extension must be less than or equal to 3 characters (doc)
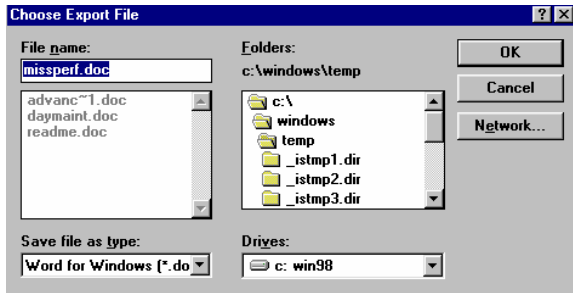
After you have entered the filename and selected the folder, select "OK". The file will be saved to your computer. You can then modify it, if needed, to include in a report.

Look at the different reports.

Operations Model Results Reports

The Mission Performance report will give you the Mission Time Standard and the Achieved Mission Time. The Achieved Mission Time is the performance time that was simulated as a result of the individual task's performance times. If the Achieved Mission Time is less than or equal to the Mission Time Standard, you will also see a message that says the mission passed the requirement. If the Mission Time Standard is less than the Achieved Mission Time, then the mission failed its performance time standard. If you did not enter a time standard, it will default to zero. Therefore, it will probably cause the percentage of time in which you met the standard to be 0%.

Mission Performance
November 12, 2002

System 0

Mission 2   VACP Exercise
Number of Times Performed: 1

	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:30:00.00	00:01:26.10	00:01:26.10	00:01:26.10	00:00:00.00	100.00
Accuracy:	This is a demonstration mission for IMPRINT training.					100.00
Mission Time AND Mission Accuracy:						100.00
RESULT: This DOES	meet the performance criterion of			75.00 %.		

The Function Performance report includes a summary of each function that was performed, the number of times it was performed, and the minimum, maximum, mean and standard deviation of the performance times. This report also indicates the function performance time standard, and compares the results of the simulation to that standard. If you did not enter a time standard, it will default to zero. Therefore, it will probably cause the percentage of time you met the standard to be 0%.

Function Performance
November 12, 2002

System   0
Mission   2   VACP Exercise

Function 1   Monitor Display
Number of times performed: 1

	Standard	Minimum	Maximum	Mean	Std. Dev.	% Met
Time <=	00:01:00.00	00:00:19.68	00:00:19.68	00:00:19.68	00:00:00.00	100.00

Function 2   Evaluate Data
Number of times performed: 1

	Standard	Minimum	Maximum	Mean	Std. Dev.	% Met
Time <=	00:01:00.00	00:00:13.86	00:00:13.86	00:00:13.86	00:00:00.00	100.00

The Task Performance report is a detailed report that provides output for each task in your mission model. The simulated (or predicted) performance time and accuracy is included on the report. The predicted values are compared to the task time standard and the percentage of occurrences in which the predicted time met the standard is reported. If you did not enter a time standard, it will default to zero. Therefore, it will probably cause the percentage of time you met the standard to be 0%. This report also includes a summary of the performance accuracy that was predicted for each task, and the number of times that task failure led to mission failure.

The Operator Workload report includes a listing of each operator's workload throughout the mission timeline. This report can easily be exported to Excel for graphing. Alternatively, you can use the Operator Workload Report - Line Graph option to get a simple graphical report.

> ****Note:** These reports will be discussed in a future tutorial
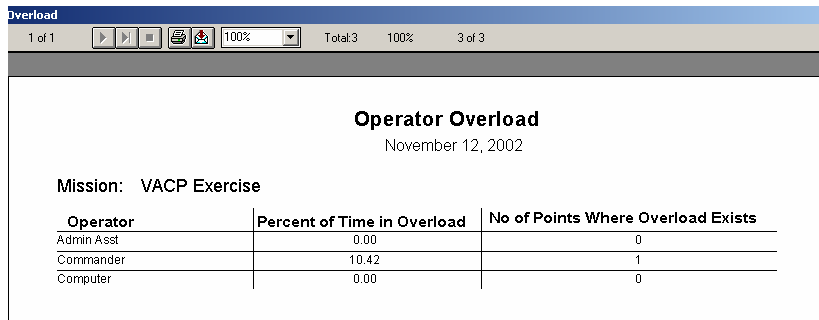
Define System Mission Exercise

The final three reports are associated with reporting <u>operator overload</u>, if any occurred during your mission.
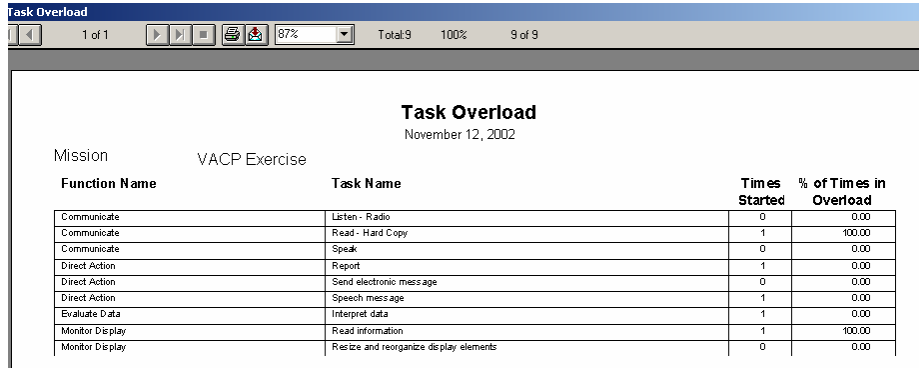
The following reports will be discussed in a future exercise in this tutorial. If you look at them now either you will have "0" in some or all fields or in the case of the Task Reallocation report you will only see the header.

<u>The Operator Overload</u> report tells you the percentage of time each operator spent in an overload condition.

Overload

| 1 of 1 | ▶ ▶ ▮ 🖨 📷 100% ▾ | Total:3 | 100% | 3 of 3 |

Operator Overload

November 12, 2002

Mission: VACP Exercise
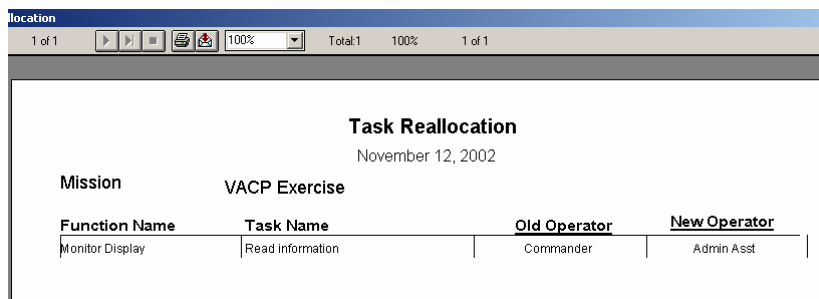
Operator	Percent of Time in Overload	No of Points Where Overload Exists
Admin Asst	0.00	0
Commander	10.42	1
Computer	0.00	0

<u>The Task Overload</u> report provides a summary of the number of times each task began, and the number of times the task began in an overload condition.

Task Overload

| ◀ ◀ | 1 of 1 | ▶ ▶ ▮ 🖨 📷 87% ▾ | Total:9 | 100% | 9 of 9 |

Task Overload

November 12, 2002

Mission   VACP Exercise

Function Name	Task Name	Times Started	% of Times in Overload
Communicate	Listen - Radio	0	0.00
Communicate	Read - Hard Copy	1	100.00
Communicate	Speak	0	0.00
Direct Action	Report	1	0.00
Direct Action	Send electronic message	0	0.00
Direct Action	Speech message	1	0.00
Evaluate Data	Interpret data	1	0.00
Monitor Display	Read information	1	100.00
Monitor Display	Resize and reorganize display elements	0	0.00

<u>The Task Reallocation</u> report summarizes the result of any task reallocation.

llocation

| 1 of 1 | ▶ ▶ ▮ 🖨 📷 100% ▾ | Total:1 | 100% | 1 of 1 |

Task Reallocation

November 12, 2002

Mission   VACP Exercise

Function Name	Task Name	Old Operator	New Operator
Monitor Display	Read information	Commander	Admin Asst

Stressors & Performance Shaping Function

The Stressors & Performance Shaping Functions are done using the **PTS** Option
(**P**ersonnel Characteristics/**T**raining Frequency/**S**tressors)

For more information on **P**ersonnel Characteristics/ **T**raining Frequency/**S**tressors see the
IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the
"Documentation" folder in your IMPRINT folder.

Use the analysis you created in the "Define System Mission Exercise" section.

Start IMPRINT, select File/Open…
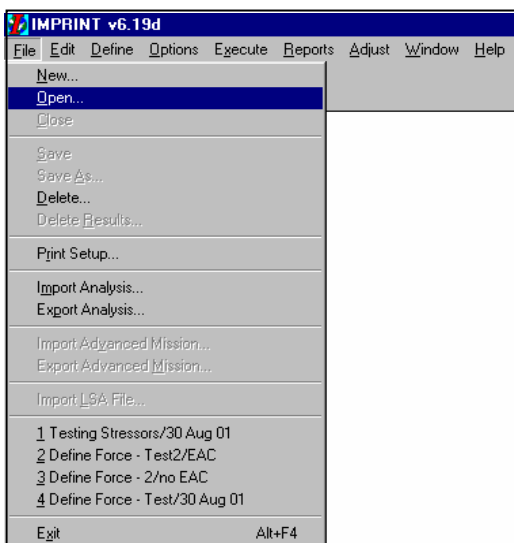
From the Open Existing Analysis screen, highlight "VACP-Exercise" (as shown below) and
select OK
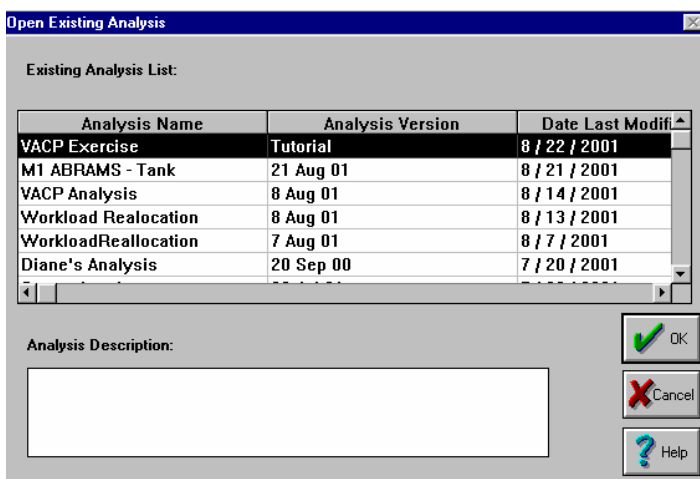
Stressors & Performance Shaping Function Exercise

Open your mission by selecting "Define/System Mission…..", then select "Open" on the
<u>Define System Mission</u> screen.
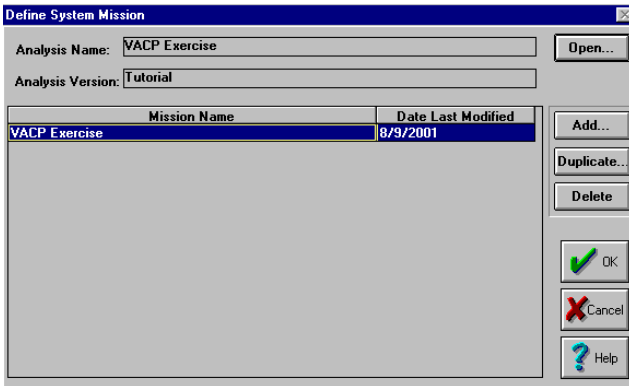
Select OK until you are back at the main screen.
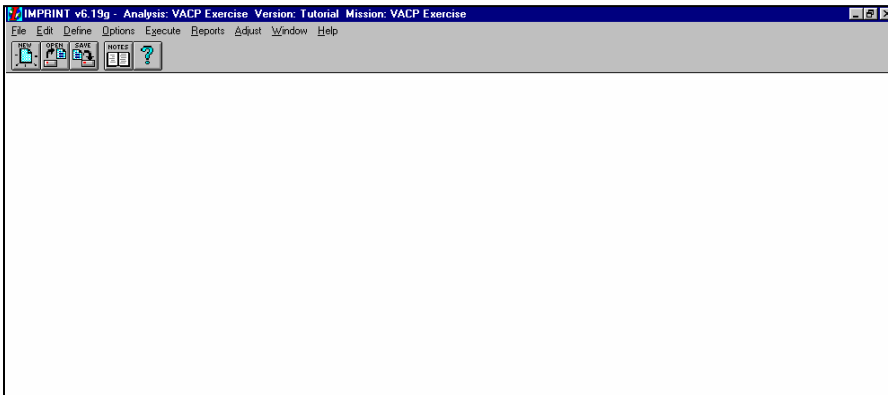
Go to "Options" and select "Map Workload to Taxons."

> ***Note:*** If you do not want to enter taxons, but you have already entered workload assignments, you can
> use the "Map Workloads to Taxons" capability. Without taxons you cannot apply Personnel Characteristics,
> Training Frequency or Stressor adjustments. (For more information on Taxons and how IMPRINT assigns
> taxons look in the "IMPRINT Users Guide" under "Taxons" and "Map Workload to Taxons" or for a quick
> look at how workload is mapped to taxons look at Mapping Workload to Taxons (page 80) at the end of this
> tutorial.)

Taxons provide a method for you to describe the composition of your task and are used in
IMPRINT to adjust estimated task times and accuracies when you apply Personnel
Characteristics, Training Frequency or Stressor adjustments.
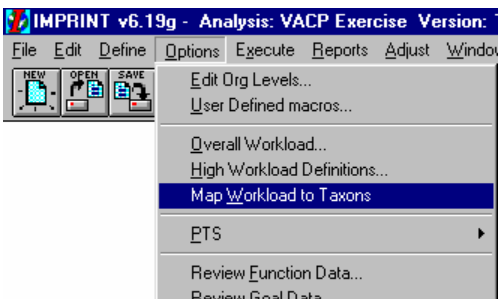
> ***Note***: This option will be useless if you have not already assigned workload. If you decide not to assign
> workload then you must manually enter the taxons.

Stressors & Performance Shaping Function Exercise
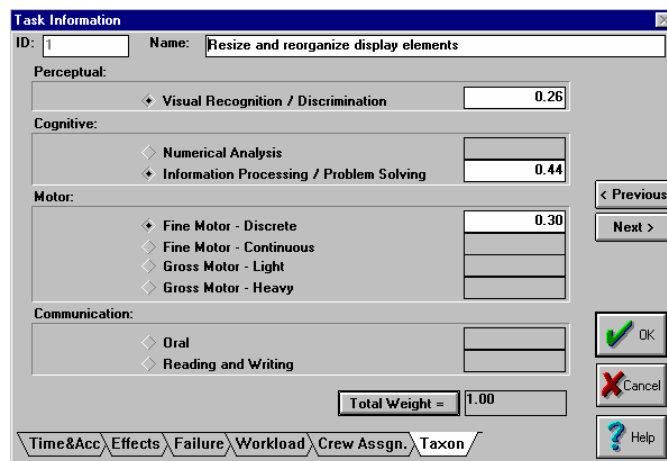
You will get a dialog box informing you what actions this option performs and asking if you want to continue. Select "Yes". Then you will get another dialog box informing you action has been taken. Select "OK".
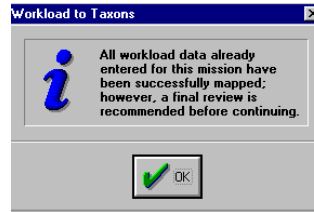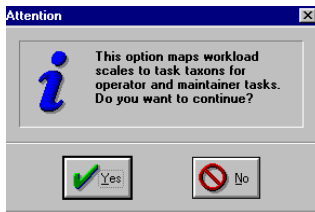
Go back to the "Network Diagram". (You will find the network diagram by selecting Define/System Mission.) On the Define System Mission screen select "Open" to open your mission. On the Mission Information screen select "Functions + Tasks".

On the Function and Task List screen select "Network Diagram". Select any function and go to the task level using the "Down" tool.

Double click on any task and select the "Taxon" tab. You will see that IMPRINT has assigned the taxons associated with the workload you have assigned:

Look at several tasks. If you have assigned some taxons and used the "Map Workload to Taxons" option, IMPRINT will not replace the taxons you have assigned. It will only assign taxons to tasks where there is workload and no previously assigned taxons.

Close and save the network diagram. Be sure to back out completely until you are back to the Main screen.

Stressors & Performance Shaping Function Exercise

Select Execute/Operations Model... Enter the number of times you want to run the mission and a random number seed. Select "Run Model" to execute   (This will be your baseline)
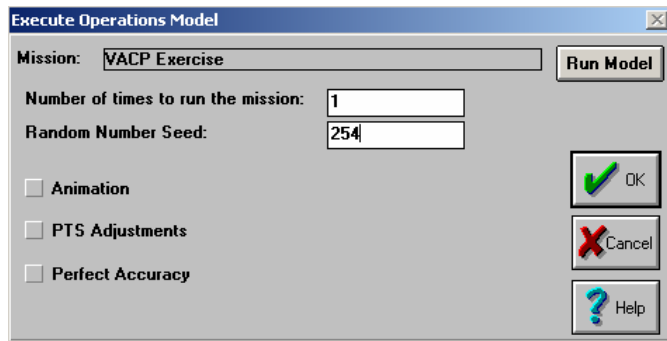
Number of times to run the mission = **1**
Random Number Seed = **254**

When finished executing you will get a dialog box informing you where to find reports. Select "OK".
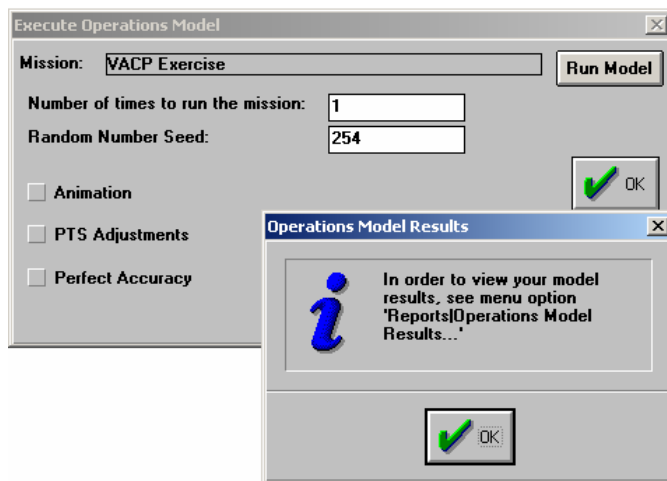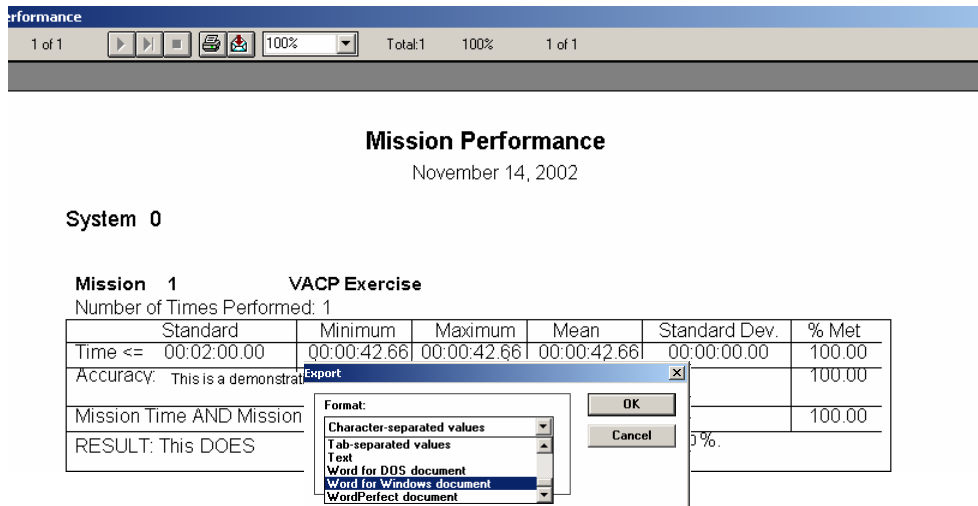
Look at results (Mission Performance, Function Performance, and Task Performance reports). If you want to keep this run to compare the results with another run, you will need to save the reports.

> ***Note:*** For this tutorial we are looking at the results on the operator side (Define System Mission). However, stressors and performance shaping functions can be applied to maintainer MOSs and in that case you would execute your maintenance model before applying, check your Maintenance Model Results reports and check them again after applying.

Stressors & Performance Shaping Function Exercise

To save a report, select the "Envelope" tool and then select the format in which you want to save the report. Select OK. In this case the format we are selecting is "Word for Windows document".

You will then see another pop-up box. Select the drive and then the folder where the report will be saved. In this example a "reports" folder was created under the IMPRINT folder to store reports. The default report name is shown. For the "Mission Performance" report the default name is "missperf.doc".

> ***Note:*** If you want to save different versions of a particular report remember to change the name each time, otherwise the previous report will be overwritten with the information from the latest run.
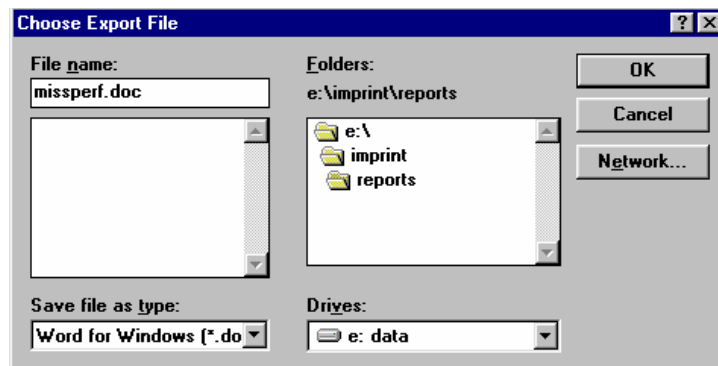
Stressors & Performance Shaping Function Exercise

Personnel Characteristics

You will now apply PTS (**P**ersonnel Characteristics **T**raining Frequency **S**tressors), execute and then compare results with your baseline.

Select Options/PTS/by MOS. – For information on PTS adjustments see the Analysis Guide, Chapters 8-10.
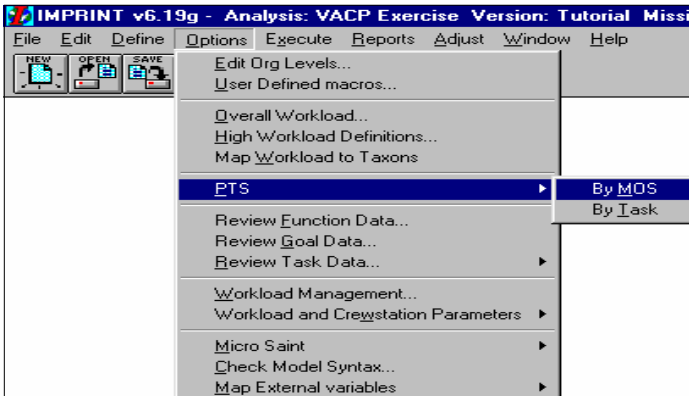
Note the original Cutoff (90).
*** Current Cutoff is minimum requirement for this MOS (see DA PAM 611-21)

Increase Personnel Characteristics – change "CutOff" to **105**.
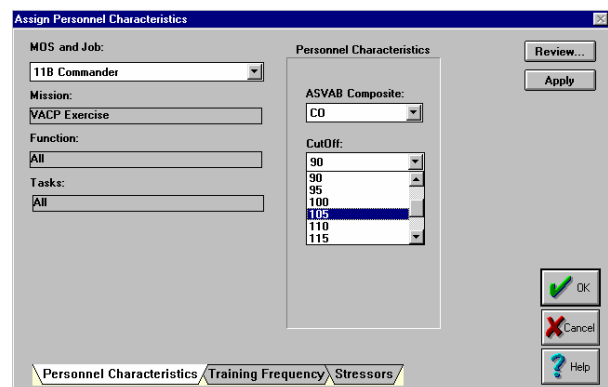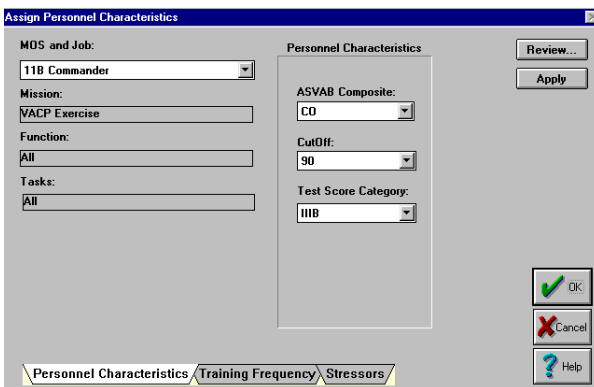
Select "Apply", then "Review". When finished reviewing the data select OK to close Review Stressors screen, select OK again to close Assign Personnel Characteristics screen

	Task	Accurac	Adj.Acc	Delta	Time	Adj.Time	Delta
1	Interpret dat	90.00	91.37	1.37	00:00:15.00	00:00:14.52	-00:00:00
2	Listen - Rad	90.00	91.13	1.13	00:00:06.00	00:00:05.90	00:00:00.
3	Read - Hard	90.00	91.30	1.30	00:00:07.00	00:00:06.79	00:00:00.
4	Report	95.00	96.14	1.14	00:00:17.00	00:00:14.61	-00:00:02
5	Resize and	50.00	51.26	1.26	00:00:30.00	00:00:29.45	-00:00:00
6	Send electro	90.00	91.27	1.27	00:00:24.00	00:00:23.48	-00:00:00
7	Speak	90.00	91.24	1.24	00:00:13.00	00:00:12.84	00:00:00.
8	Speech mes	90.00	92.49	2.49	00:00:10.00	00:00:09.84	00:00:00.

Note the "Deltas". The CutOff was increased. This caused the Accuracy to increase and the Time to decrease. In this case it appears that all tasks were affected. However, there may be times when you will not see any affect.

Stressors & Performance Shaping Function Exercise

To see what types of tasks are impacted see "PTS Impact on Tasks" on page 78.

Go to Execute, select Adjustment - use same number of runs and random number. Then select "Run Model."
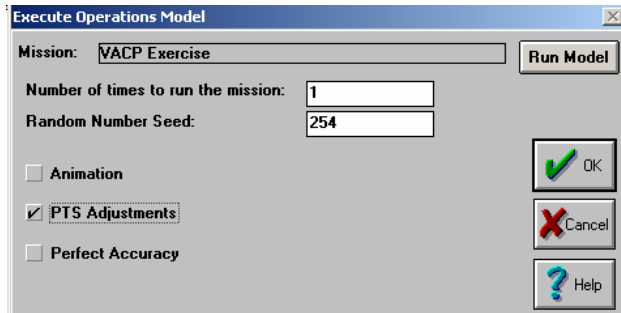
When "Adjustment" is selected IMPRINT will use the task times and accuracies that were adjusted as a result of the applied Personnel Characteristics, Training Frequency and/or Stressors.

When you select "Adjustment you will see the following dialog box to remind you that if you have NOT applied stressors you should return to the "Options" menu and do so. In this example, "stressors" refers to the Personnel Characteristics you just applied.
Select OK
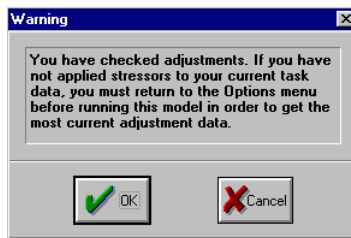
When finished select OK when you see the message referring to reports and go look at results. Compare to baseline. Do you see any changes?

Mission Performance

November 14, 2002

System 0

Mission 1   VACP Exercise
Number of Times Performed: 1

	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:02:00.00	00:00:42.06	00:00:42.06	00:00:42.06	00:00:00.00	100.00
Accuracy:	This is a demonstration mission for IMPRINT training.					100.00
Mission Time AND Mission Accuracy:						100.00
RESULT: This DOES		meet the performance criterion of		75.00 %.		

Stressors & Performance Shaping Function Exercise

Training Frequency

Select Options/PTS/by MOS. Set "Personnel Characteristics " back to original by reapplying the original cutoff. Select the original "CutOff", in this case the original "CutOff" was 90, and then select "Apply". Select "Apply" a second time. (Be sure to select apply twice to ensure data are set back to original.)

Select "Training Frequency" tab.   Change "Training Frequency" to
Less than twice per year

Select "Apply", then "Review". When finished reviewing the data select OK, select OK again.

Stressors & Performance Shaping Function Exercise

Execute- with Adjustment - use same number of runs and random number.
Look at results. Compare to baseline. Are there any changes?

Stressors

Select Options/PTS/by MOS. Select "Training Frequency" tab. Reapply original "Training Frequency" ("Once a Month"). (Remember to select apply twice!)
Select Stressors tab   Set "MOPP Level" to **4**

Select "Apply", then "Review". When finished reviewing the data select OK, select OK again.

Stressors & Performance Shaping Function Exercise

Execute- with Adjustment - use same number of runs and random number.
Look at results. Compare to baseline. Are there any changes?

Mission Performance
November 14, 2002

System 0

Mission   1   VACP Exercise
Number of Times Performed: 1

	Standard	Minimum	Maximum	Mean	Standard Dev.	% Met
Time <=	00:02:00.00	00:00:43.80	00:00:43.80	00:00:43.80	00:00:00.00	100.00
Accuracy:	This is a demonstration mission for IMPRINT training.					100.00
Mission Time AND Mission Accuracy:						100.00
RESULT: This DOES	meet the performance criterion of			75.00 %.		

⇒ What happens if you decrease/increase CutOff?

⇒ What happens if you decrease /increase Training Frequency?

⇒ How does applying **P**ersonnel Characteristics/**T**raining Frequency/**S**tressors affect your
performance?

Define Soldier Exercise

Define Soldier

For more information see the <u>IMPRINT Analysis Guide</u> and the <u>IMPRINT User Guide</u>. Both are located in the "Documentation" folder in your IMPRINT folder.

In this exercise we are using Define Soldier in standalone mode. Therefore, we are creating a new analysis. However, you will want to use Define Soldier when creating operator and maintenance models. It is recommended that you select Define Soldier before you get deep into creating your models so that the MOSs that you need will be available. Otherwise you will have to go back and enter the MOSs.
Create a new analysis.
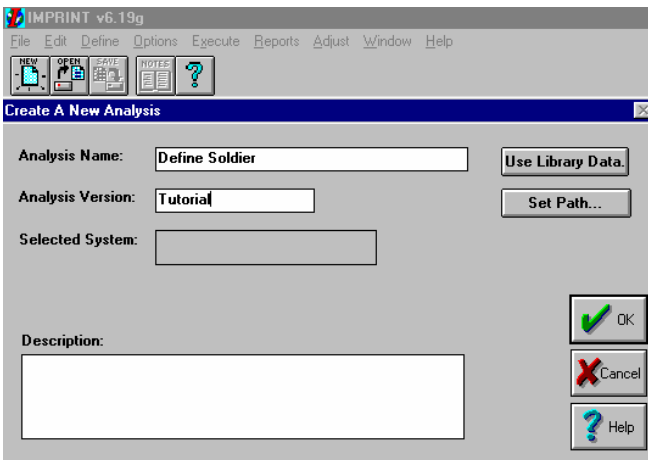
Analysis Name: **Define Soldier**
Analysis Version: **Tutorial**

Select Define/Soldiers…
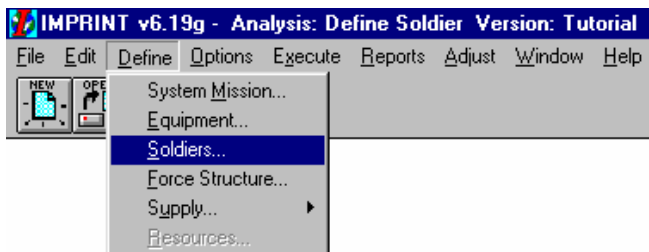
When you get to the <u>Define Soldier</u> screen select "Add MOS…"
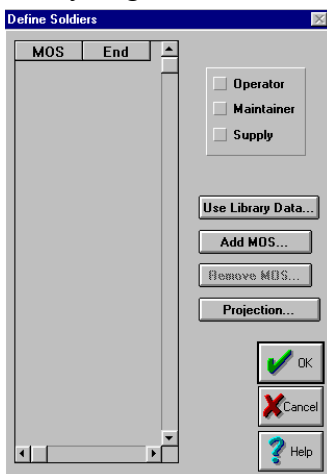
Define Soldier Exercise

On the <u>MOS Directory</u> screen, select MOS 11B, select OK and select "Operator"
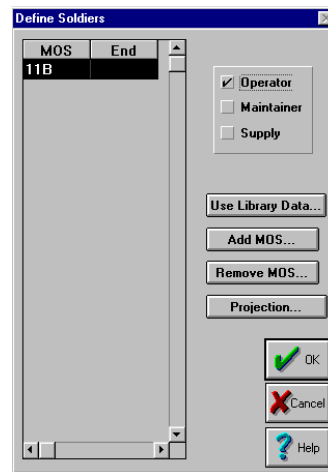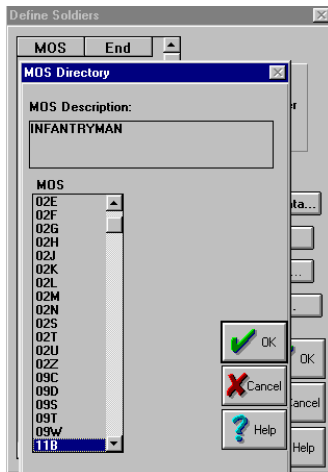
Select "Add MOS…", select MOS 45D, select OK and select "Maintainer"
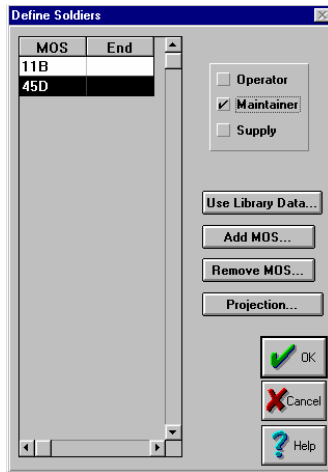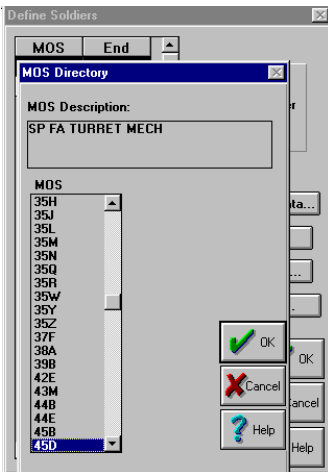
> ***Note:*** When are only doing "Projections" it is not required to select "type." However, if you do not select the type of MOS (Operator, Maintainer, Supply) the MOS will not be available under Define System Mission, Define Equipment, or Define Supply. You can select more than one type. The MOS you select can be all three types and will be listed under all three areas.

Define Soldier Exercise

Projections

Select "Projection…"

Highlight both MOSs and look at the different parameters.
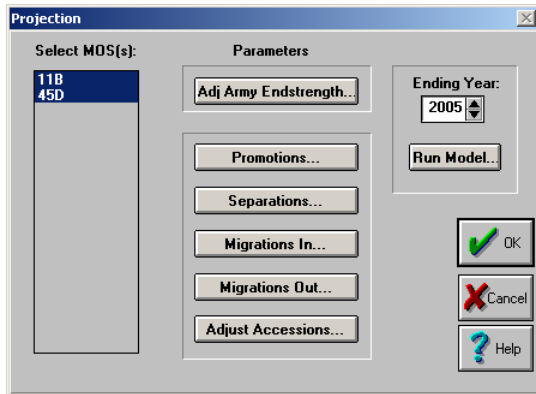
Look at:
  "Adj. Army Endstrength…"

Total number in Army at time Enlisted Master File was imported (1997)

"Promotions…"

% promoted to rank E4 – E9

Define Soldier Exercise

"Separations…"

MOS	E1-3	E4	E5	E6	E7	E8-9
11B	0.16	0.38	0.15	0.07	0.10	0.21
45D	0.13	0.24	0.06	0.00	0.00	0.00

% leaving Army.

"Migrations In…"

MOS	E1-3	E4	E5	E6	E7	E8-9
11B	0.20	0.03	0.02	0.00	0.00	0.00
45D	0.01	0.02	0.02	0.00	0.00	0.00

% coming from another MOS

"Migrations Out…"

MOS	E1-3	E4	E5	E6	E7	E8-9
11B	0.00	0.06	0.03	0.03	0.00	0.07
45D	0.01	0.12	0.18	0.00	0.00	0.00

% going to another MOS

"Adjust Accessions…"

MOS	Test Score Category	Gender	Education	Available
11B	I, II ,IIIA	Male	HS	4481
11B	IIIB	Male	HS	3788
11B	IV	Male	HS	9808
11B	I, II ,IIIA	Female	HS	4481
11B	IIIB	Female	HS	3788
11B	IV	Female	HS	9808
11B	I, II ,IIIA	Male	NHS	1749
11B	IIIB	Male	NHS	1878
11B	IV	Male	NHS	43342
11B	I, II ,IIIA	Female	NHS	1749
11B	IIIB	Female	NHS	1878
11B	IV	Female	NHS	43342
45D	I, II ,IIIA	Male	HS	37

Number available in
the general population.

Define Soldier Exercise

Select "Ending Year", then select "Run Model"
When finished you will see a dialog box informing you that you may view your projection reports by using the menu option "Reports/Projection Results…". Select 'OK" and select "OK" again to get back to the Define Soldiers screen.
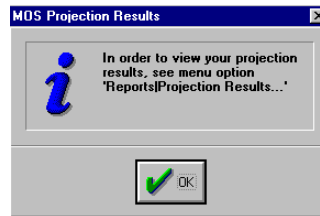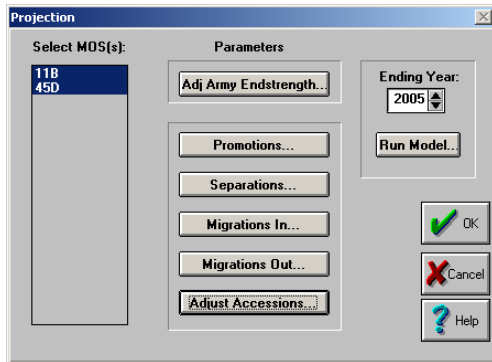
Notice that the "End" field now has date. This is the "Ending Year" selected on the Projection screen. Select "OK" and go to Reports.
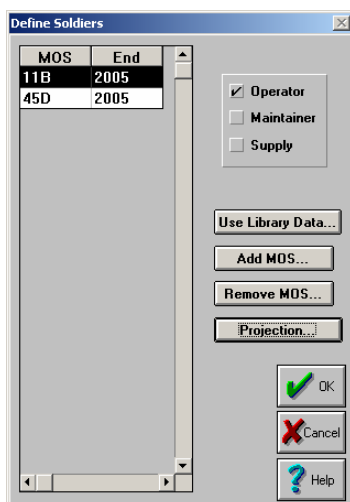
Define Soldier - Reports.
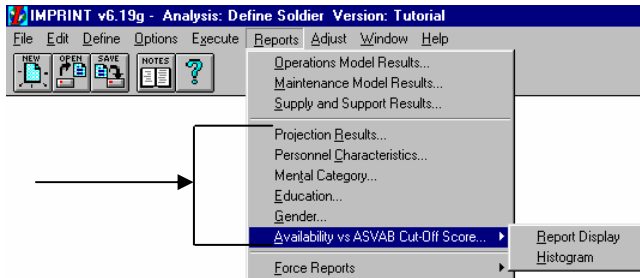
For each of the reports you can select the parameters that are of interest.

"Projection Results…" Use this report to get the number of people in each MOS by grade.

"Personnel Characteristics…" Use this report to get a list of the numbers of soldiers in each MOS that have specific personnel characteristic levels. Use the buttons to select the characteristic for which you want to view a report.

Define Soldier Exercise

Reading Grade Level

Analysis Name: Define Soldier
Analysis Version: Tutorial
11/22/02

IMPRINT Personnel Characteristics Distribution Report
Reading Grade Level (Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2005

MOS		≤7	7-8	9-10	11-12	≥12	Total
11B	E1-E3	35.68	1,695.05	1,515.61	3,447.11	336.55	7,030.00
	E4	24.32	1,283.23	1,145.52	2,782.95	484.98	5,701.00
	E5	21.76	842.34	810.08	2,017.43	218.39	3,910.00
	E6	58.08	1,161.74	845.93	1,902.31	179.94	4,148.00
	E7	31.36	644.78	438.34	898.81	99.71	2,113.00
	E8-E9	8.64	246.76	171.04	306.22	39.54	773.00
	Total	179.84	5,853.90	4,927.32	11,354.83	1,359.11	23,675.00

MOS		≤7	7-8	9-10	11-12	≥12	Total
45D	E1-E3	0.32	22.33	21.30	43.51	0.54	88.00
	E4	0.16	9.52	9.29	21.73	0.30	41.00
	E5	0.16	8.74	8.81	16.15	0.14	34.00
	E6	0.00	0.00	0.00	0.00	0.00	0.00
	E7	0.00	0.00	0.00	0.00	0.00	0.00
	E8-E9	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.64	40.59	39.40	81.39	0.98	163.00

Weight Lift

Analysis Name: Define Soldier
Analysis Version: Tutorial
11/22/02

IMPRINT Personnel Characteristics Distribution Report
Weight Lift (Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2005

MOS		Light	Medium	Heavy	Total
11B	E1-E3	16.99	1,240.61	5,772.40	7,030.00
	E4	4.79	957.93	4,738.29	5,701.00
	E5	0.91	657.52	3,251.57	3,910.00
	E6	0.00	707.07	3,440.93	4,148.00
	E7	0.78	366.00	1,746.22	2,113.00
	E8-E9	0.29	137.71	635.00	773.00
	Total	23.75	4,066.84	19,584.41	23,675.00

MOS		Light	Medium	Heavy	Total
45D	E1-E3	0.17	16.21	71.62	88.00
	E4	0.00	7.10	33.90	41.00
	E5	0.00	6.25	27.75	34.00
	E6	0.00	0.00	0.00	0.00
	E7	0.00	0.00	0.00	0.00
	E8-E9	0.00	0.00	0.00	0.00
	Total	0.17	29.56	133.27	163.00

Begin again here……

PULHES

Analysis Name: Define Soldier
Analysis Version: Tutorial
11/25/02

IMPRINT Personnel Characteristics Distribution Report
PULHES: Eyes (Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2005

MOS		1	2	≥2	Total
11B	E1-E3	5,404.79	1,625.21	0.00	7,030.00
	E4	4,362.26	1,338.74	0.00	5,701.00
	E5	3,002.18	907.82	0.00	3,910.00
	E6	3,203.55	944.45	0.00	4,148.00
	E7	1,634.34	478.66	0.00	2,113.00
	E8-E9	598.62	174.38	0.00	773.00
	Total	18,205.74	5,469.26	0.00	23,675.00

MOS		1	2	≥2	Total
45D	E1-E3	68.07	19.93	0.00	88.00
	E4	31.68	9.32	0.00	41.00
	E5	26.46	7.54	0.00	34.00
	E6	0.00	0.00	0.00	0.00
	E7	0.00	0.00	0.00	0.00
	E8-E9	0.00	0.00	0.00	0.00
	Total	126.21	36.79	0.00	163.00

ASVAB

Analysis Name: Define Soldier
Analysis Version: Tutorial
11/25/02

IMPRINT Personnel Characteristics Distribution Report
ASVAB (Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2005

MOS		≤75	75-84	85-94	95-104	105-114	115-124	125-134	Total
11B	E1-E3	28.31	255.03	935.05	1,750.08	2,332.55	1,372.75	342.30	7,016.07
	E4	20.33	181.65	685.03	1,319.24	1,887.97	1,213.65	382.25	5,690.12
	E5	13.85	126.45	471.88	920.24	1,334.99	819.48	214.23	3,901.12
	E6	23.19	206.68	629.10	1,023.81	1,306.27	764.75	189.49	4,143.29
	E7	13.08	115.22	344.10	539.02	639.32	365.57	94.37	2,110.68
	E8-E9	4.74	41.36	130.81	209.33	228.54	123.72	33.21	771.51
	Total	103.50	926.39	3,195.77	5,761.72	7,729.64	4,659.92	1,255.85	23,632.79

MOS		≤75	75-84	85-94	95-104	105-114	115-124	125-134	Total
45D	E1-E3	.84	5.29	13.71	25.88	26.98	13.46	2.71	88.87
	E4	.35	2.16	5.76	11.56	13.06	7.01	1.48	41.38
	E5	.35	2.19	5.56	10.62	10.51	4.40	.77	34.40
	E6	.00	.00	.00	.00	.00	.00	.00	.00
	E7	.00	.00	.00	.00	.00	.00	.00	.00
	E8-E9	.00	.00	.00	.00	.00	.00	.00	.00
	Total	1.54	9.64	25.03	48.06	50.55	24.87	4.96	164.65

Define Soldier Exercise

"Mental Category…" Use this report to get a list of the numbers of soldiers in each MOS that have specific mental category levels.

Analysis Name: Define Soldier   11/25/02
Analysis Version: Tutorial

IMPRINT Personnel Characteristics Distribution Report
AFQT (Number of People)

Test Score Category: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2005

		I	II	IIIA	IIIB	IV	Total
	E1 - E3	288.00	2,451.00	1,942.00	2,126.00	223.00	7,030.00
	E4	447.00	2,094.00	1,451.00	1,557.00	152.00	5,701.00
MOS:	E5	191.00	1,461.00	1,149.00	973.00	136.00	3,910.00
11B	E6	154.00	1,374.00	1,027.00	1,230.00	363.00	4,148.00
	E7	88.00	629.00	484.00	716.00	196.00	2,113.00
	E8 - E9	36.00	191.00	180.00	312.00	54.00	773.00
	Total	1,204.00	8,200.00	6,233.00	6,914.00	1,124.00	23,675.00

		I	II	IIIA	IIIB	IV	Total
	E1 - E3	0.00	27.00	29.00	30.00	2.00	88.00
	E4	0.00	15.00	13.00	12.00	1.00	41.00
MOS:	E5	0.00	7.00	14.00	12.00	1.00	34.00
45D	E6	0.00	0.00	0.00	0.00	0.00	0.00
	E7	0.00	0.00	0.00	0.00	0.00	0.00
	E8 - E9	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.00	49.00	56.00	54.00	4.00	163.00

"Education…" Use this report to get a list of the numbers of soldiers in each MOS that have specific education levels.

Analysis Name: Define Soldier   11/25/02
Analysis Version: Tutorial

IMPRINT Personnel Characteristics Distribution Report
Education (Number of People)
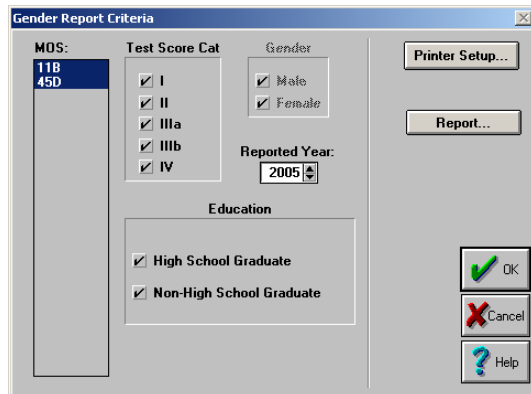
Test Score: I II IIIA IIIB IV
Education: HSGrad, Non-HSGrad
Gender: Male, Female
Year: 2005

		HS Grad	Non-HS Grad	Total
	E1 - E3	7,030.00	0.00	7,030.00
	E4	5,701.00	0.00	5,701.00
MOS:	E5	3,910.00	0.00	3,910.00
11B	E6	4,148.00	0.00	4,148.00
	E7	2,113.00	0.00	2,113.00
	E8 - E9	773.00	0.00	773.00
	Total	23,675.00	0.00	23,675.00
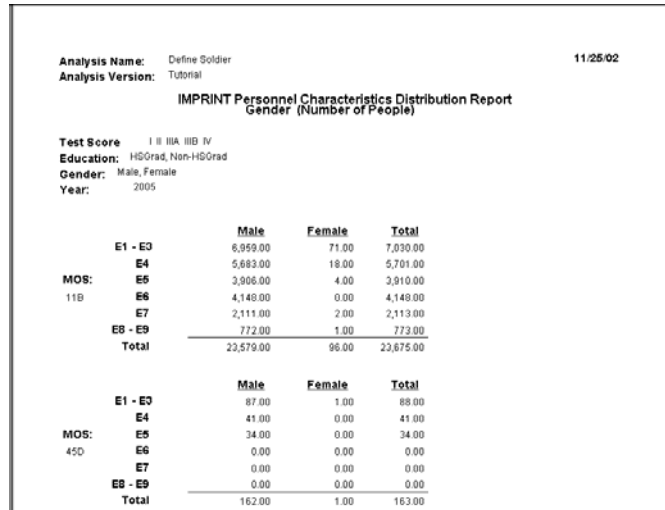
		HS Grad	Non-HS Grad	Total
	E1 - E3	88.00	0.00	88.00
	E4	41.00	0.00	41.00
MOS:	E5	34.00	0.00	34.00
45D	E6	0.00	0.00	0.00
	E7	0.00	0.00	0.00
	E8 - E9	0.00	0.00	0.00
	Total	163.00	0.00	163.00

Define Soldier Exercise

"Gender…" Use this report to identify the number of soldiers in each MOS by gender, for each category you have checked.

"Availability vs ASVAB Cutoff Score …" (Report/Histogram Display). Use this report to get numbers of soldiers in each MOS that have specific ASVAB Cutoff Levels. You can select the year and the MOS for which you want the data to be displayed. The report also provides the percentage of the population that is available under each cutoff score. You can also get a graphical view of these data by selecting the Histogram view on the cascading menu for this report item.

Define Soldier Exercise

Report   *Histogram Display*

Analysis Name: Define Soldier
Analysis Version: Tutorial

Availability vs. ASVAB Cut-Off Score Report

Year: 2005

MOS	ASVABComposite	ASVAB Cut-Off Score	Number Available	Percent Available
11B	CO	0	23,832	99.82
11B	CO	75	23,539	99.38
11B	CO	80	23,310	98.46
11B	CO	85	22,602	95.47
11B	CO	90	21,330	90.10
11B	CO	95	19,407	81.97
11B	CO	100	16,781	70.88
11B	CO	105	13,645	57.64
11B	CO	110	10,078	42.57
11B	CO	115	5,915	24.99
11B	CO	120	2,755	11.64
11B	CO	125	1,255	5.30
11B	CO	130	403	1.70
11B	CO	135	0	0.00

Define Equipment

Define Equipment helps you estimate maintenance manhour requirements for your system as well as help you estimate your system's reliability, availability, and maintainability (RAM). For more information, see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your IMPRINT folder.

Create a "New" analysis.

Use the "New" ![icon] button or select File/New from the menu bar.
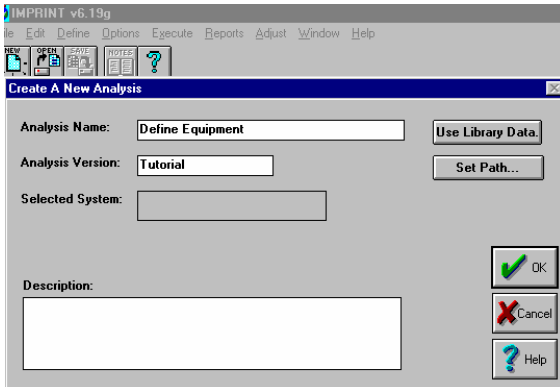
Analysis Name: **Define Equipment**
Analysis Version: **Tutorial**

When finished select OK.

Select Define/Soldiers… add 3 MOSs – 45G, 45K, 63E.
(See "Define Soldier" for information on how to add MOSs)
For this exercise select "Maintainer" as the type of MOS for all three and select "Supply" for MOSs 63E and 45G. (MOS 63E and 45G will be listed as maintainers under Define Equipment. Both MOSs will also be listed under Define Supply, which you will see later in this section.)
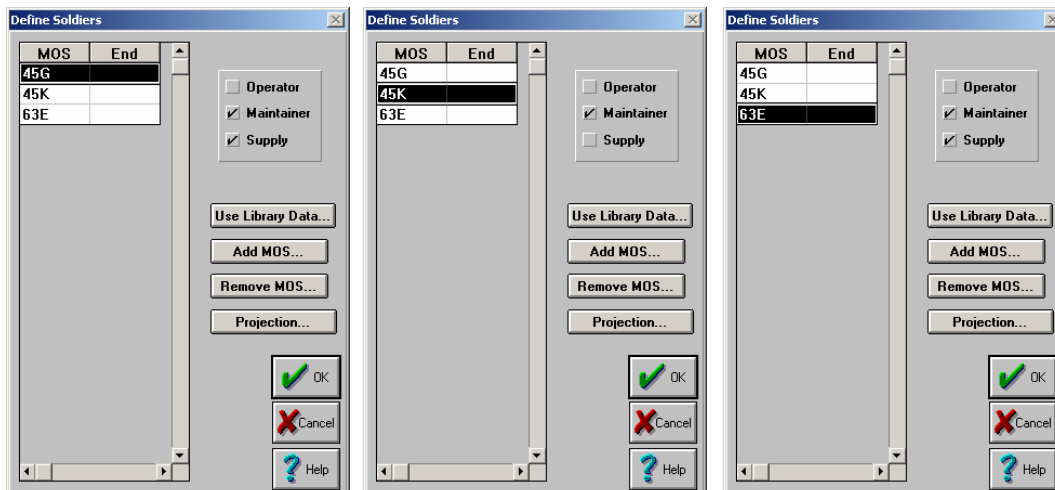
When finished select OK.

Define Equipment Exercise

Select Define/Equipment… and use the "Define Equipment Exercise Data Sheet" on page 81 for this exercise.
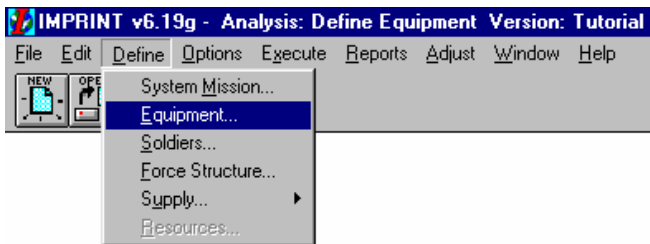
Adding Subsystems

Select "Add" and enter the first subsystem name, found under the "Subsystem" column on the "Define Equipment Exercise Data" sheet.
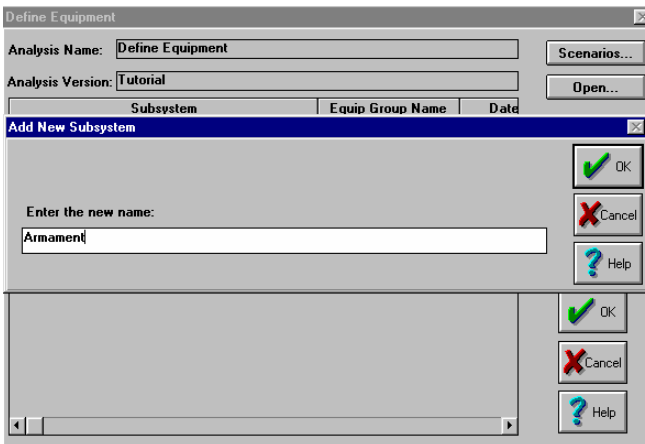
Hit Enter then hit Enter again. This will bring up the "Add New Subsystem" entry screen again. Add the second subsystem. Hit Enter then hit Enter again. Now enter the third subsystem. If you had more subsystems, you would continue until all were entered. When you finished you should have the following Subsystems: **Armament**, **Communications** and **Engine**.

When finished entering the subsystem enter the "Equip Group Name" listed under the "EquipGrp" column on the Define Equipment Exercise Data" sheet.
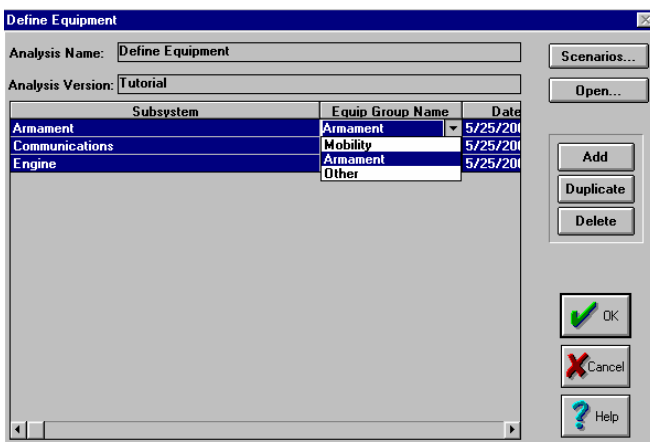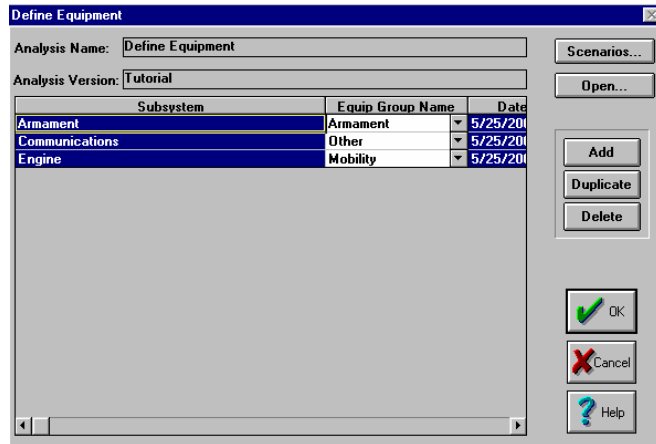
Subsystem	*Equip Group Name*
Armament	**Armament**
Communications	**Other**
Engine	**Mobility**

Define Equipment Exercise

Note: The "Equip Group Name" designates how the "MOUBF" ("Mean Operational Unit Between Failure" or more commonly known as "Mean Time Between Failure" (MTBF)) will be defined. If the subsystem is defined as "Armament" then the MOUBF will be in "Rounds" fired. If it's defined as "Mobility", then the MOUBF will be in "Distance" traveled. If it's defined as "Other" then the MOUBF will be in "Hours" (the amount of time that the system has been operating.)

After you have entered the last subsystem – and made the "Equip Group Name" selections - Highlight the first subsystem (Armament) and select "Open".

Adding Components

Start adding the components for the selected subsystem. You will find the components associated with each subsystem under the "Component" column on the Define Equipment Exercise Data" sheet.

Define Equipment Exercise

1. Select "Add" and enter the first component name.
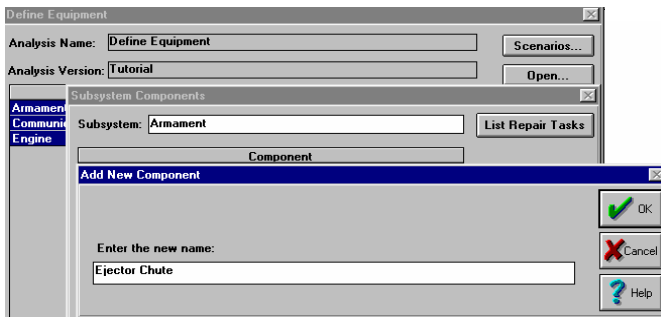
2. Hit Enter then and hit Enter again. This will bring up another "Add New Component" entry screen. Add the next component.

3. Do this until you have entered all your components for the selected subsystem.

4. When finished entering the components for a subsystem you can select "Next". This will take you to the next subsystem on the list.

5. Go through steps 1 – 4 until you have entered all the components for all the subsystems.

When completed you should have the following Components for each Subsystem:
<u>Armament</u>: **Ejector Chute**; **Ammo Chute**; **Recoil Mechanism**; **Barrel Assembly**
<u>Communications</u>: **Rec/Trans**; **AM 1780 VRC**; **Communications**
<u>Engine</u>: **Starter**; **Fuel Pump**; **Engine, Other**

When you are finished entering all the components you go back to the first subsystem (Armament) and begin entering the data for each component. You can do this by selecting the "Previous" button until you see the first subsystem listed in the "Subsystem" field on the <u>Subsystem Components</u> screen. You will find the repair task for each subsystem/component under the "Action/Maint Type" columns on the Define Equipment Exercise Data" sheet.

Highlight the first component (Ejector Chute) and select "List Repair Tasks:
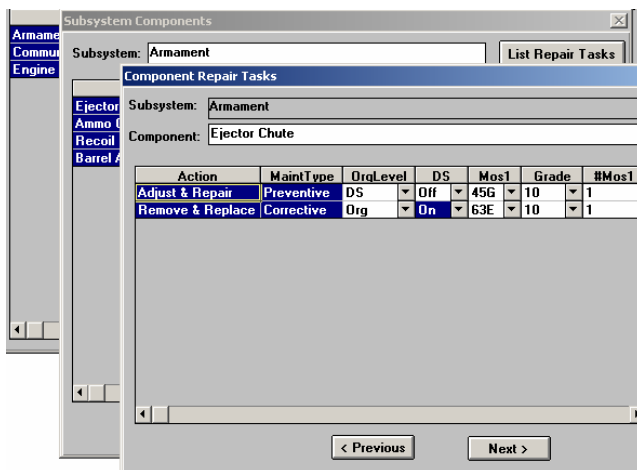
Define Equipment Exercise

All the fields are shown below.

Action	MaintType	OrgLevel	DS	Mos1	Grade	#Mos1	Mos2	Grade	#Mos2	MOUBF(Rounds)	MTTR	SD MTTR	Distribution	Abort%	ContactTeam
Adjust & Repair	Preventive	DS	Off	45G	10	1			0	150.00	00:01:30.00	00:00:00.00	Normal	0.00	No
Remove & Replace	Corrective	Org	On	63E	10	1			0	150.00	00:01:30.00	00:00:00.00	Normal	0.00	No

The required fields for each Component/Action/Maint Type are – "Org Level", "DS", "Mos1", "Grade", "#Mos1", "MOUBF" and "MTTR". In this exercise, you will also enter data in the "Abort%" field for some components. However, this information is not required.

> ***Note:*** The "OrgLevel" will always default to "Org and the field "DS" will always be "On". (If a field is highlighted then you cannot edit that field.) There are defaults for the different levels. "OrgLevel" "DS" defaults to "Off" but can be changed to "On".
> "OrgLevel" "GS" is set to "DS" to "Off" and cannot be changed.

> If the Org Level field is set to "Org" (unit) then the component is repaired "On" the equipment.

> If the Org Level field is set to "DS" (direct support) then the component can be repaired "On" or "Off" the equipment.

> If the Org Level field is set to "GS" (general support) then the component is always repaired "Off" equipment.

> The Org Level influences how and when equipment is repaired in the model.

1. Select "Add" and select the first repair task for the first component.
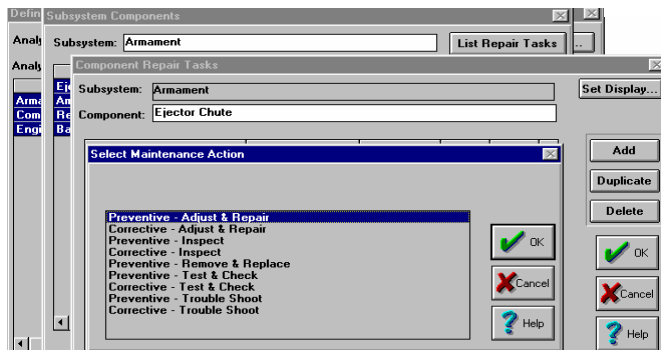
2. Select "OK".

3. Enter the data for the component's task. The required data can be found on the "Define Equipment Exercise Data" sheet on page 82. When finished entering the data for a component select OK.

4. Do steps 1-3 for each task associated with the component.

5. When you are finished entering the data for a component, select OK, select "Next" to get to the next subsystem.

6. Do steps 1-5 until you have entered all the data for each subsystem/component.

Define Equipment Exercise

7. When finished, select "OK" on each screen until you have completely backed out and save your analysis.

To save either use the "Save" button or select File/Save from the menu.

Creating a Scenario

The scenario will define the conditions under which the system you are modeling will be used and the amount of usage the components in each system will incur. You can have multiple scenarios.

Select Define/Equipment
Select "Scenarios…".
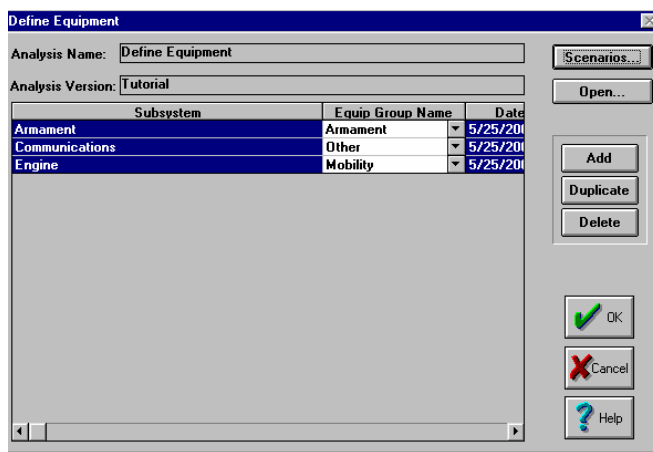
Select "Add" and enter a Scenario name. Select "OK"
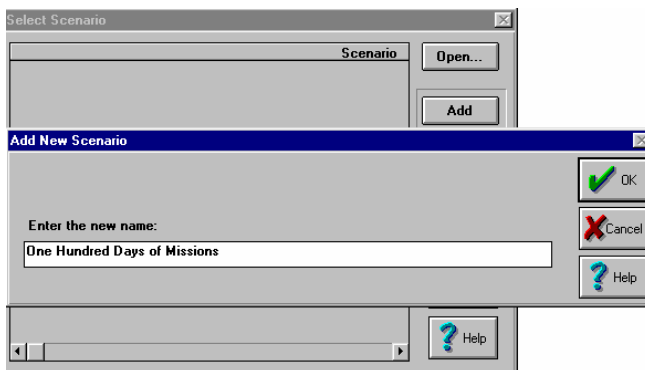
Enter the new name:
One Hundred Days of Missions

Define Equipment Exercise

Select "Open"
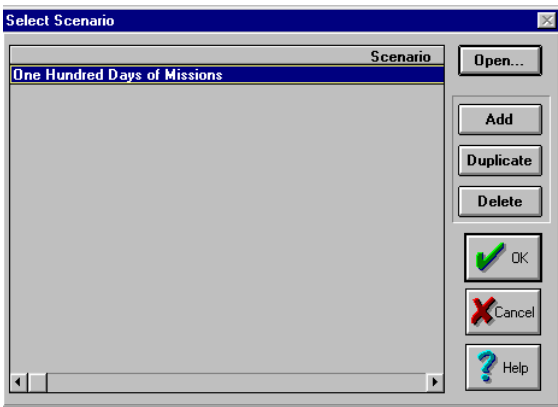
Select "Segments…"
Scenario segments will determine subsystem usages and probabilities for combat damage. Each scenario can contain multiple segments.
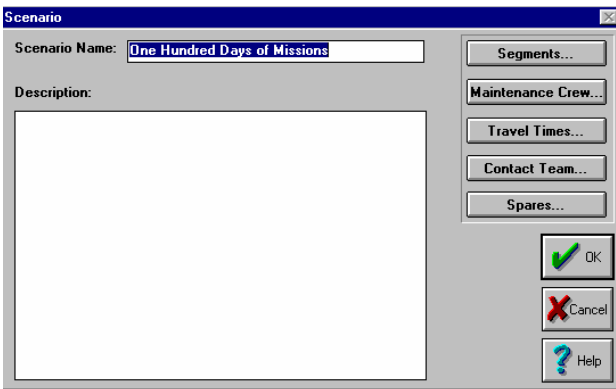
Select "Add" and enter a Segment name. Select "OK"
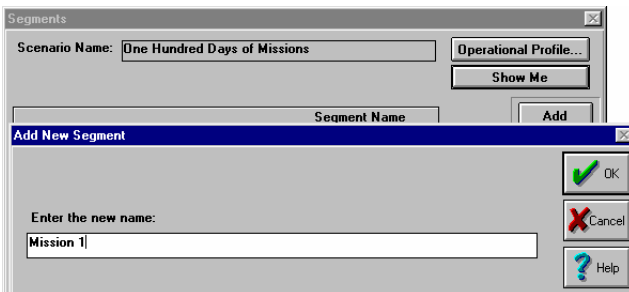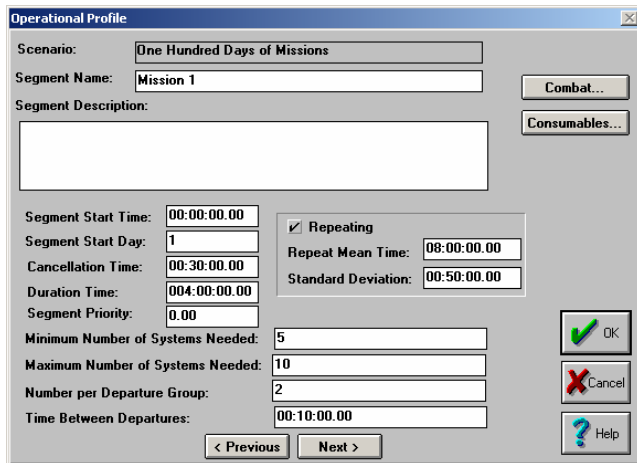
Enter the new name: **Mission 1**

Select "Operational Profile…"
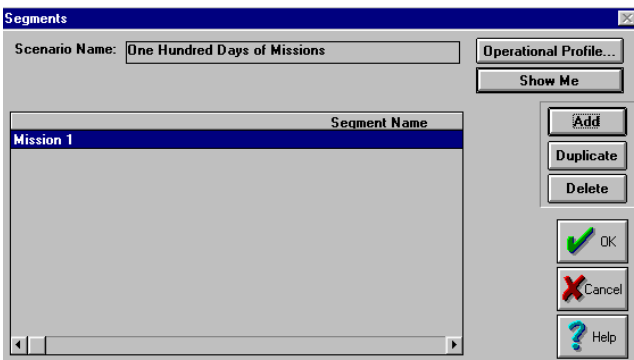
Define Equipment Exercise

Cancellation Time = **00:30:00.00**
Duration: = **0004:00:00.00**

Select   "Repeating"
Repeat Mean Time = **08:00:00.00**
Standard Deviation = **00:50:00.00**

Min # of System Needed = **5**
Max # of System Needed = **10**
Number per Departure = **2**
Time Between Departures = **00:10:00.00**

Select "Consumables…"

Distance per hour per Segment = **40.00**
Load Time per segment = **00:10:00.00**
System fuel usage (gallon/distance unit) = **20.00**
Armament = **50**

Note: System fuel usage is used to help calculate the Supply and Support requirements that will be covered later in this tutorial

Select "OK" on each screen until you are back to the Scenario screen.
Select "Maintenance Crew".

Shift Length = **8.00**
Shifts per Day = **2**
Select "Accept"

Define Equipment Exercise

Back out, save your analysis and go to Execute/Maintenance Model.
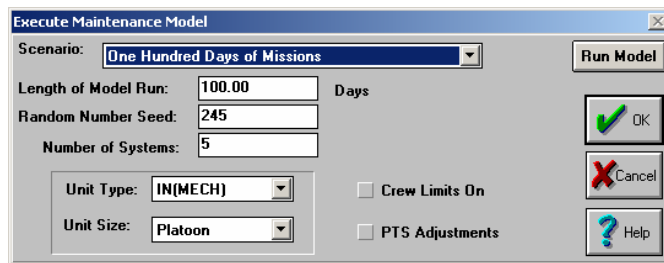
Length of Model Run = **100**
Random Number Seed = **245**
Number of Systems = **5**
Unit Type = **IN(MECH)**
Unit Size = **Platoon**

Select "Run Model."

Look at reports.
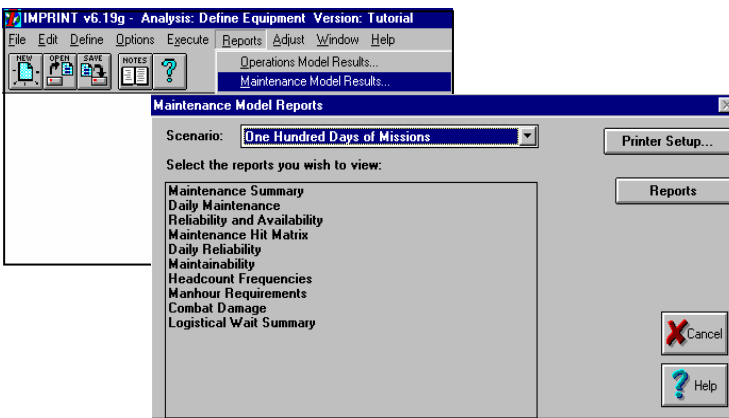
Save reports. (See "Saving Reports" (page 25) to see example).

Go back to Execute/Maintenance Model.
This time select "Crew Limits On"
> ***Note:*** When you select "Crew Limits On", you are telling IMPRINT to use the crew size you designated. When you do NOT select "Crew Limits On", IMPRINT will assume unlimited number of people available to do the work.

Select "Run Model."
Look at results. Compare to previous results.
Was there any effect?

Go back to the Define Equipment/Scenarios/Open/Segment/Operational Profile screen and select "Combat"

Define Equipment Exercise

Enter data.

Probability of combat hit per hour = **25.00**
Probability of attrition if hit = **1.00**
System replacement time (hours) = **0.30**
System repair time if damaged = **1.00**

Execute Model without crew restraints – (deselect "Crew Limits On")
Look at results.

Go back to Define/Equipment/Scenario/Open/Travel Times…

Travel time to Org = **0.30**
Travel time to DS = **0.45**
Travel time to GS = **0.50**
From Org to DS = **1.00**
From DS to GS = **0.55**
From Org to GS = **0.45**

Execute Model.
Look at the results.

Define Equipment Exercise

Go back to Define/Equipment/Scenario/Open/Spares…

% Available = **50.00**
Wait in Hours = **1.00**

Execute model and look at "Logistical Wait" report.

If you decide to apply stressors and/or performance shaping functions to your maintainers, don't forget to select "PTS Adjustment" when you execute you model. If you do not, there will be no change in your results.

If you check "PTS Adjustments" any applications of personnel characteristics and or stressors will be used to modify Mean Time to Repair (MTTR) data for each task. At this time, there are no reliable data to show how Training Frequency is affected. If you do not check adjustments, the maintenance model will run with the original (or baseline) MTTR data.

IMPRINT does not require the user to enter Taxons for maintenance task; but IMPRINT does apply taxons based on the type of repair task. (See "Define Equipment" on page 79.)

Define Equipment Exercise

Maintenance Model Results Reports

The Maintenance Summary report contains four data items that summarize the maintenance requirements that were generated during the simulation. This report includes the average corrective and preventive maintenance manhours that were simulated for each system. These are calculated by taking the total amount of manhours in each category, and dividing by the total number of systems in the scenario. Also included is the average maintenance manhours simulated per operational hour. This is calculated by dividing the sum of the preventive and corrective maintenance manhours by the total operating hours for all systems.

The Daily Maintenance report contains the amount of maintenance manhours that were simulated at all organizational level types (e.g., ORG, DS, GS) for both maintenance types (e.g., preventive, corrective). This report has scroll bars to scroll up and down, as well as left and right.

The values in this report are totals across all systems.

The Reliability and Availability report has two parts. The first part is the Reliability Summary. It includes the number of segments requested and accomplished during the simulation. The report also includes measures for the number of times systems were requested, and the number of times that those system requests were accomplished. If you had one segment and a maximum of two systems assigned to that segment, then that will be reported as "Number of times Systems Requested" = 2. If only one of the systems actually performed the segment (because the other system was either busy or in maintenance), then that will be reported as "Number of times System Requests Accomplished" = 1.

The second part of the screen includes an Availability Summary. The values are calculated as follows:

Average inherent availability = ((scenario length in hours x # of systems) minus (total clock hours on corrective maintenance)) divided by (scenario length in hours x # of systems)

Average achieved availability = ((scenario length in hours x # of systems) minus (total clock hours on corrective + preventive maintenance)) divided by (scenario length in hours x # of systems)

(Note that inherent & achieved availability consider the total number of days simulated in hours (e.g., 365 * 24), minus the number of clock hours spent in maintenance. Therefore, if 2 or more soldiers are working at the same time on the same system, there are counted just once. Similarly, if two maintenance tasks are being worked at the same time, it is only counted once.)

Readiness = segments accomplished divided by segments requested.

The Maintenance Hit Matrix report is an exhaustive listing of the maintenance tasks that occurred during your simulation.

This report includes maintenance tasks that never occurred. You will identify those actions by noting the zeros in the "Occurrences," or number of occurrences, column. If many of your tasks have not occurred, it indicates that your simulation did not run long enough for the system to require these maintenance tasks (i.e., the mean operational units between failure (MOUBF) for

the tasks is longer than the simulation time period). This probably indicates that you should lengthen the simulation run, and re-execute the model.

Since maintenance tasks are triggered by comparing their MOUBF to a standard exponential curve of accrued usage on each component in the system, there is some randomness associated with simulating when the maintenance task will occur. For this reason, we recommend that you execute the IMPRINT scenario with a variety of random number seeds to ensure that you have generated a representative set of results.

The Daily Reliability report provides a summary of the number of segments and segment requests generated by the simulation for each day of the scenario.

The Maintainability report includes the simulated maintenance manhours per operational hour. This is calculated by dividing the total manhours of maintenance performed on each subsystem by the total number of operational hours of the scenario. Also, the simulated manhours per hour are reported. This measure is calculated by dividing the total manhours of maintenance performed on each subsystem by the total length of the scenario (in hours).

The Headcount Frequencies report contains the percentage of time that different numbers of people were busy for a specific MOS and organizational level type (e.g., ORG, DS, GS). This report is based on the entire length of the simulation, not just the times during the simulation that this MOS was busy or on duty.

This report provides a measure of MOS utilization. It illustrates the frequency with which different numbers of people in each MOS were used. The highest bin for which a > 0% utilization is shown will never exceed the shift manning levels you set for that MOS and that organizational level type. Additionally, if the highest bin shown has a relatively high frequency, as in the example of 20% of the time three people being used, then it is possible that you have constrained this MOS so tightly that it is reducing system availability.

We recommend that you perform the first IMPRINT maintenance model run with the shift manning levels unconstrained. This will result in a simulation that optimizes system availability from the perspective of manpower. Put another way, the simulation will assume that the manpower required to perform any maintenance action will be available. After running the IMPRINT maintenance model in the unconstrained mode, you should examine this Headcount Frequency report for guidance on how to best constrain your shift manning pools (i.e., to minimize the effect on system availability). We recommend that you focus on reducing manpower pools for MOS's that have low utilizations.

The Manhour Requirements report has three columns. They are organizational level, MOS and direct maintenance manhours. This report is useful for identifying the MOS's that are performing the most maintenance.

The Combat Damage report is a brief report that lists the number of combat hits that were simulated for all your systems throughout the entire length of the simulation run. This report also lists the number of simulated attritions, or kills. Finally, the repair time in total number of hours is included. These metrics are stochastically driven as a result of the combat parameters entered earlier in IMPRINT.

Define Equipment Exercise

The combat parameters are mission-specific and include the probability of combat hit per hour, the probability of attrition or repair, and the time it takes to either replace a destroyed system or repair a damaged system.

The Logistical Wait Summary Maintenance report includes two measures. These are the amount of time systems spent waiting for spare parts and the amount of time systems spent waiting for maintainers. Each of these measures are reported by organizational level.

If the amount of time systems spent waiting for spare parts is excessive, you will want to either increase the probability that spares are available or decrease the amount of time required to procure a spare under the "Spares" button in "Define Equipment."

If the amount of time systems spent waiting for maintainers seems excessive, you will either want to increase the number of people in your manpower pools, or you should increase your shift lengths, or you could decrease the operational profile for your systems. Each of these options are available under the "Define Equipment" portion of IMPRINT.

Define Equipment Exercise

Define Supply
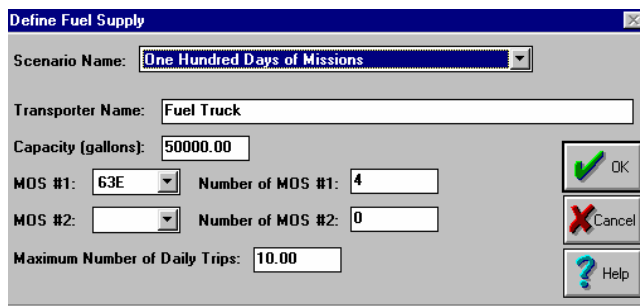
You can enter information on how the necessary fuel and ammunition will be supplied to your systems in each scenario under this IMPRINT option. This information, along with the data entered under Define Equipment, allows IMPRINT to calculate the number of transporters and the associated manpower that will be required to support each scenario.

Fuel

First, you need to select the scenario for which you want to set the fuel supply parameters. For this tutorial we have only one scenario. Then, you need to enter the Transporter Name, the capacity of that transporter, the manpower required for the transporter, and the maximum number of trips the transporter makes in a single day.

IMPRINT will use this information to calculate the number of transporters and the associated manpower required to supply the necessary fuel. After executing the maintenance model, the supply results will be presented in the Supply and Support Results.

Select Define/Supply/Fuel and enter data.

Transporter Name = **Fuel Truck**

Capacity (gallons) = **50000.00**

MOS #1 = **63E**
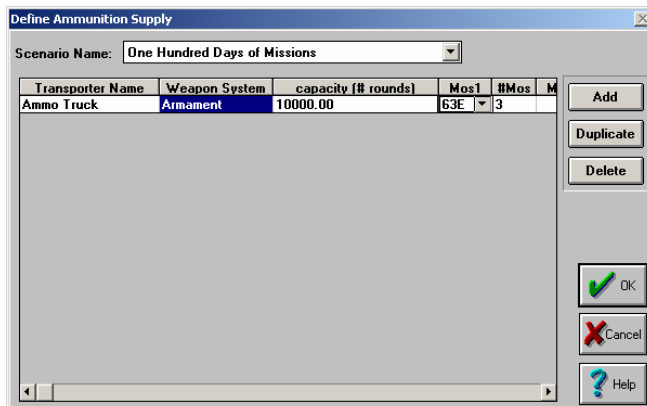
Number of MOS #1 = **4**

Minimum Number of Daily Trips = **10.00**

Ammunition

First, you need to select the scenario for which you want to set the ammunition supply. For this tutorial we have only one scenario. Then select a Weapon System and fill in the remainder of the data elements. This includes the Transporter Name, the capacity of the transporter, the manpower required for the transporter, and the maximum number of trips the transporter makes in a single day.

Select Define/Supply/Ammunition and enter data.

Transporter Name = **Ammo Truck**

Capacity (# rounds) = **10000.00**

MOS 1 = **45G**

#MOS = **3**

Max # of Daily Trips = **3.00**

Define Equipment Exercise

Look at Reports
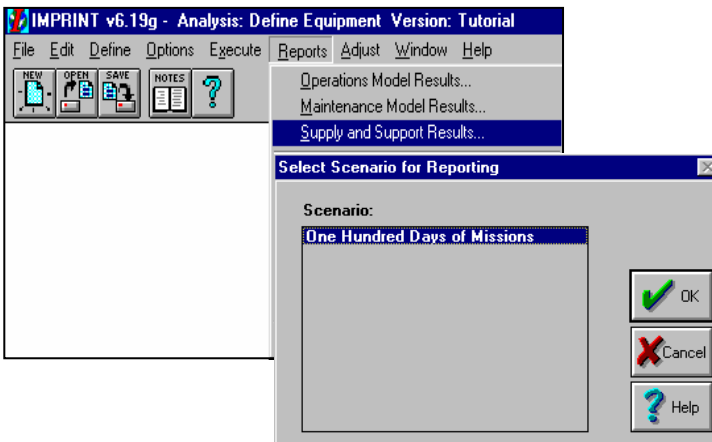
This report contains the fuel and ammunition requirements needed in order to support a mission. These support requirements are based on the daily fuel and ammunition requirements for a particular scenario entered under Define Equipment and the capacity and manpower available per transporter entered under Define Supply. The columns of the report are:
- ◆ Subsystem name
- ◆ Transporter name
- ◆ Total number of trips needed
- ◆ First MOS that was assigned to transport the fuel
- ◆ Number of the transporters of the first MOS that must work together to perform the task
- ◆ Second MOS that was assigned to transport the fuel
- ◆ Number of the transporters of the second MOS that must work together to perform the task.

Workload

Overall Workload

For more information on "Overall Workload" see the IMPRINT Analysis Guide and the IMPRINT User Guide. Both are located in the "Documentation" folder in your IMPRINT folder.

Use the analysis you created in the "Define System Mission Exercise" section.

Start IMPRINT. Select File/Open…
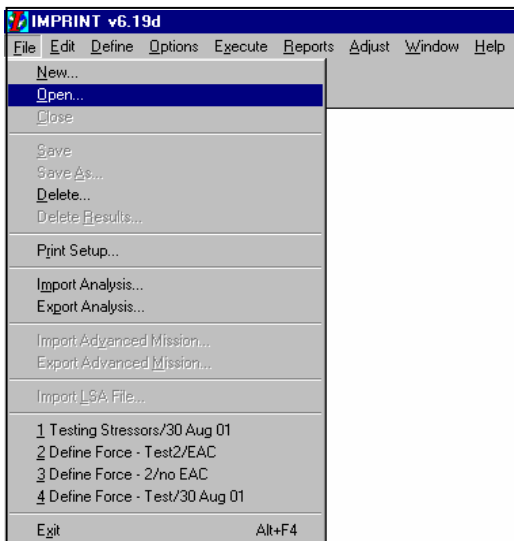
From the Open Existing Analysis screen, highlight "VACP-Exercise" (as shown below) and select OK
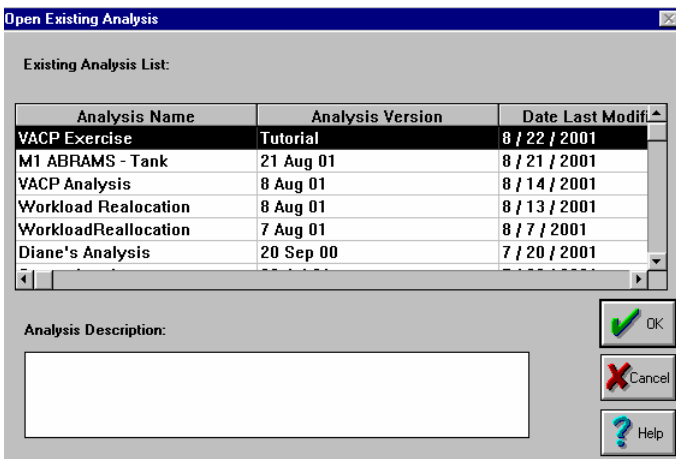
Open your mission by selecting "Define/System Mission…..".

Workload Exercise

Select "Open" on the <u>Define System Mission</u> screen.
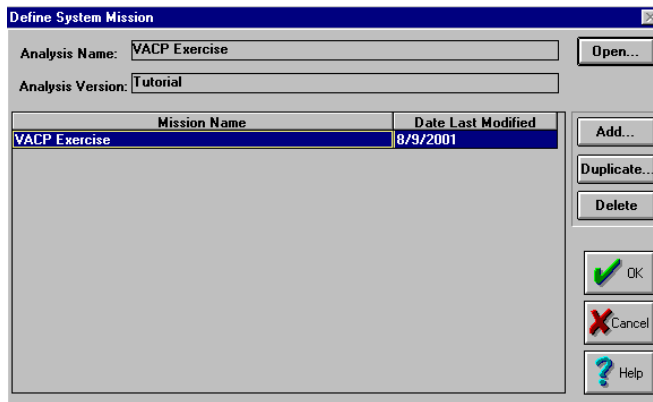
When you get to the <u>Mission Information</u> screen, select OK.
Select OK until you are back to the main screen.
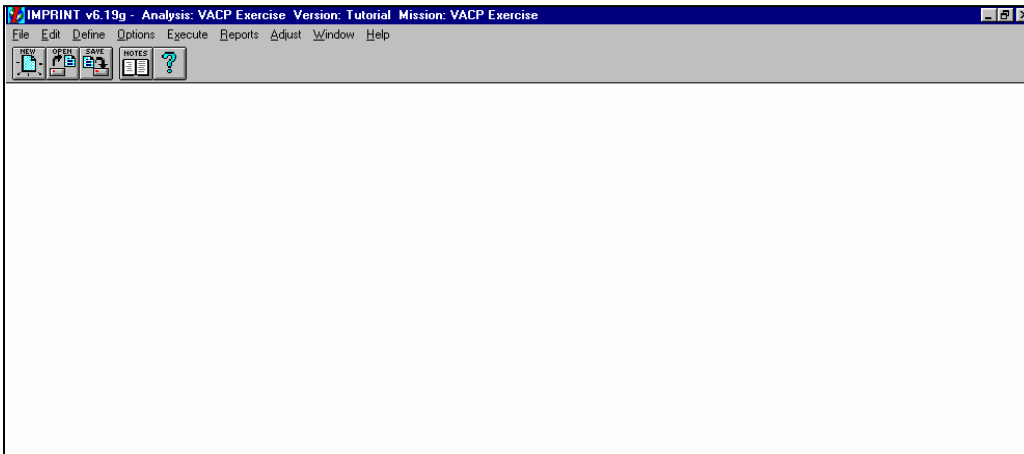
Go to "Options" and select select Options/Overall Workload.
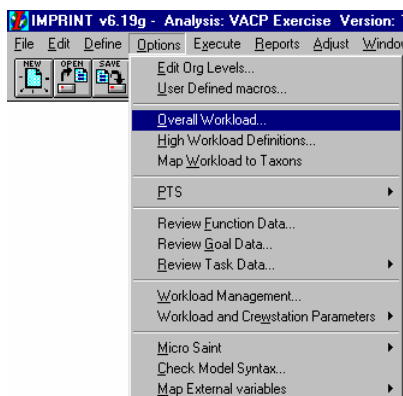
This option allows you to define an overall workload measure for VACP Missions. In essence, it is used to combine the four workload channels into a single combined channel.
For this exercise we are adding all four channels. To do this
       Select "Visual (V)" then select "+" under Operators
       Select "Auditory (A)" then select "+" under Operators
       Select "Cognitive (C)" then select "+" under Operators
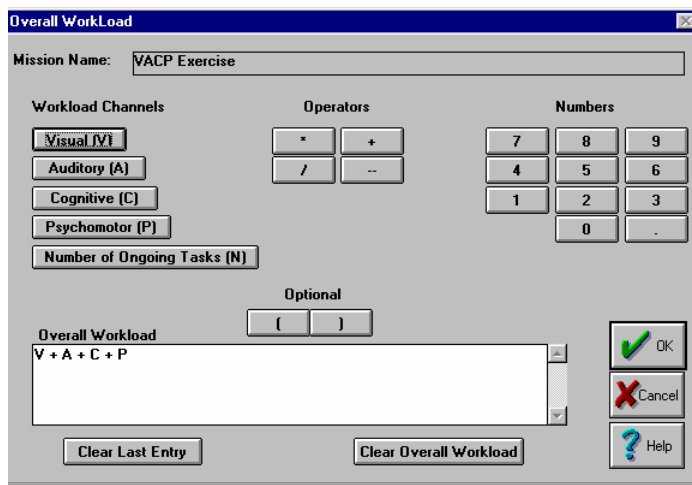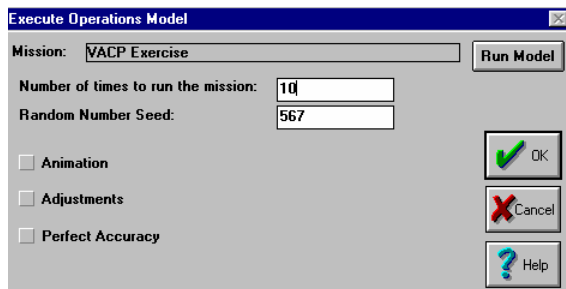
Workload Exercise

Select "Psychomotor (P) then select "+" under Operators

When you are finished your Overall Workload field should look the same as the screen below.

Select "OK"

Go to Execute/Operations Model

Select "Run Model"

When finished, select "OK" and then select Reports/Operations Model Results… Select the Operator Workload Report and the Operator Workload – line graph Report.

Operator Workload
January 14, 2003

System:
Mission: VACP Exercise

Operator	Time	Visual	Auditory	Cognitive	Psychomotor	Number	Overall
Commander	00:00:00.00	9.90	0.00	12.10	9.20	2	31.20
Commander	00:00:07.01	4.00	0.00	6.80	4.60	1	15.40
Commander	00:00:23.92	5.90	0.00	5.30	0.00	1	11.20
Commander	00:00:37.01	5.90	4.90	10.60	0.00	2	21.40
Commander	00:00:41.58	5.90	0.00	5.30	0.00	1	11.20
Commander	00:00:45.87	5.00	0.00	6.80	0.00	1	11.80
Commander	00:01:05.93	5.90	1.00	5.30	7.00	1	19.20
Commander	00:01:11.58	5.90	5.90	10.60	7.00	2	29.40
Commander	00:01:20.01	5.90	1.00	5.30	7.00	1	19.20
Commander	00:01:29.11	0.00	0.00	0.00	0.00	0	0.00

Workload Exercise

Operator Workload

AnalysisName   VACP Exercise
AnalysisVersion   Tutorial
MissionName   VACP Exercise

Commander
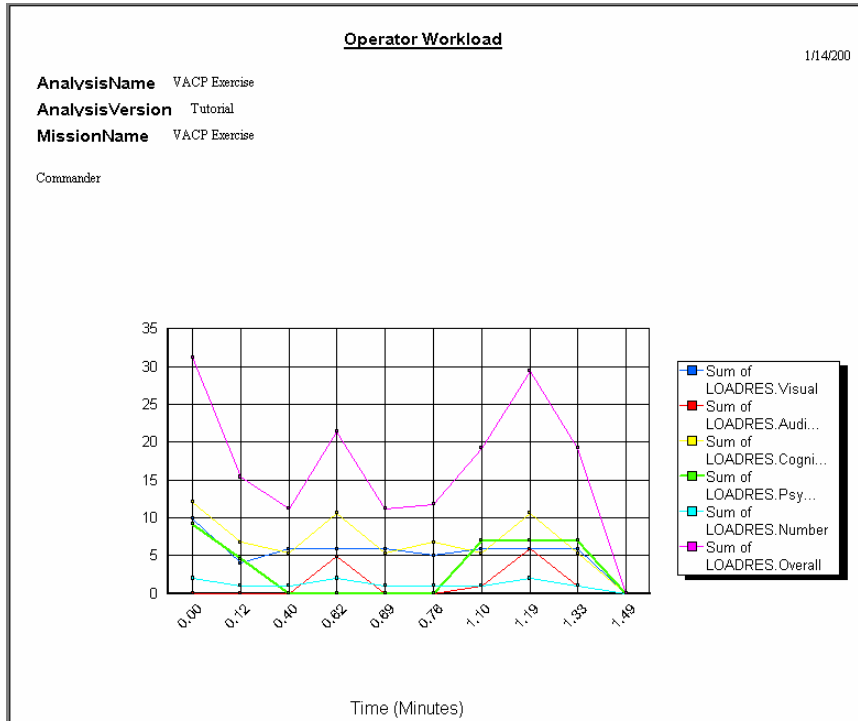
Now go back and execute your mission 1 time. Look at the report again. It should have the same results. IMPRINT only looks at the first run for workload.

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Sharing Your Analysis

IMPRINT allows you to share your analysis with others and vice-versa. When an analysis is imported/exported, the analysis and all its data are made available to another user. You can also export an analysis for archiving purposes.

You can import an analysis that was created in an older version of IMPRINT. Importing the analysis will automatically translate it into a format that is compatible with your version.

Both the import or export commands are available only when no analysis is open.

Exporting

To export an analysis select File/Export Analysis… from the menu.
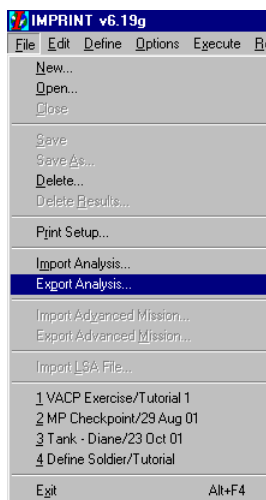
You will then see Export Analysis screen. This screen lists all of your analyses.
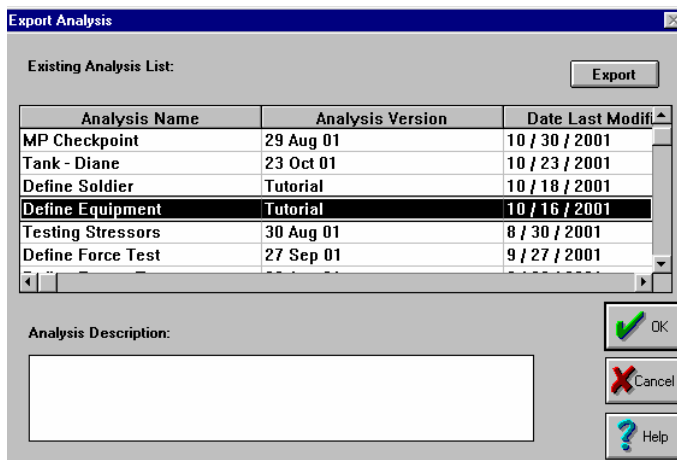
Select the analysis you want to export and then select "Export".

Sharing Your Analysis

You will then see the <u>Export IMPRINT Analysis…</u> screen and will be prompted for a filename. Notice that the extension an exported file in IMPRINT is ".imp". IMPRINT cannot import any other type of file.
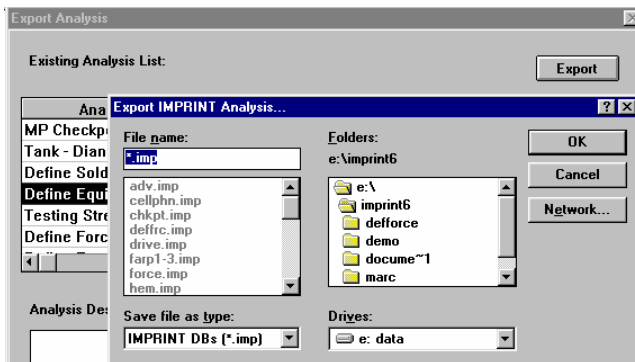
Select the name you want to give the export file. The default folder is your IMPRINT folder. You can select a different folder/drive.
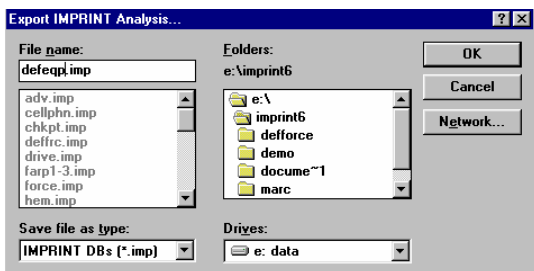
File name: = **defeqp.imp**

Select "OK" when finished

Importing

To import an analysis select <u>File/Import Analysis…</u> from the menu.
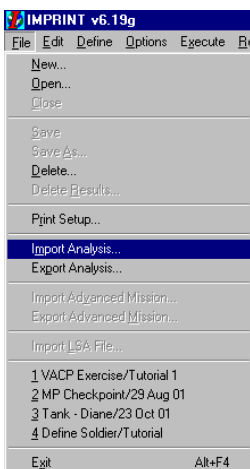
You will then see the <u>Import IMPRINT Analysis…</u> screen. The default will be your IMPRINT folder. If the file you want to import is in another folder/drive, select the correct folder.

Sharing Your Analysis
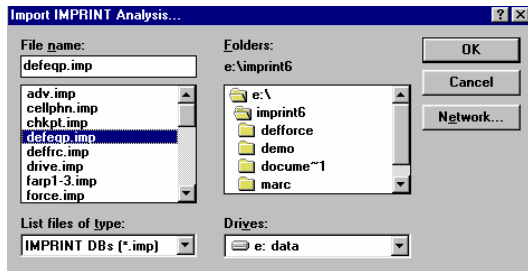
In this example we are selecting the file we exported "defeqp.imp". After you have selected the file select "OK". IMPRINT will import the analysis. If you already have an analysis with the same name and version number, then you will see this dialog box:
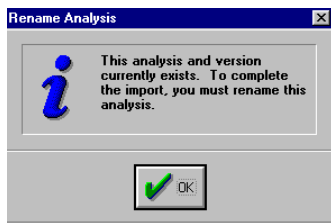
Select "OK" and when you get the Save Analysis As screen, enter a new name and/or a new version. In this example we are using the same name but changed the version.
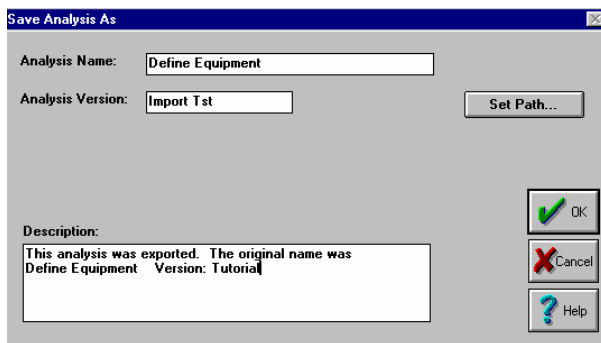
Analysis Name: **Define Equipment**
Analysis Version: **Import Tst**

Select "OK"

This does not open the analysis. You must select File/Open on the menu bar or use the "Open" button.
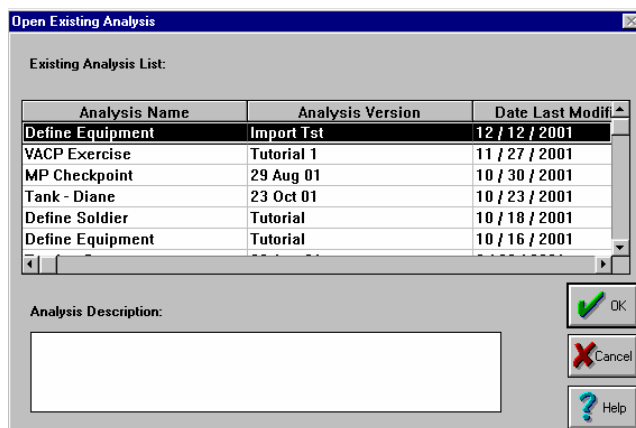
Using Library Data

To use library data the process is the same as creating a new analysis. The difference will be that you will select "Use Library Data…"

> ***Note:*** You can enter the "Analysis Name" and "Analysis Version" before or after you select "Use Library Data…"
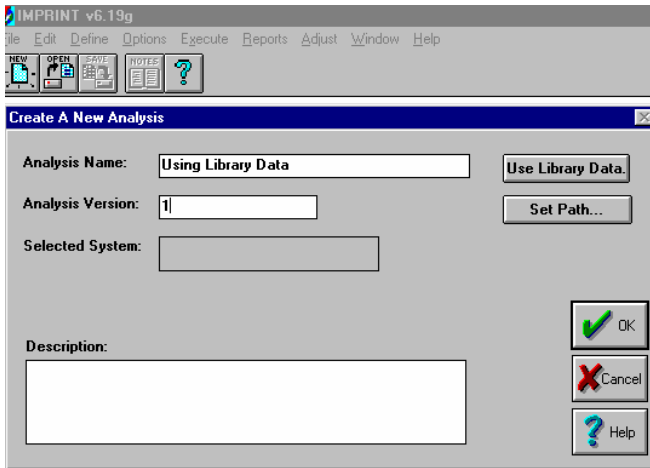
On the <u>Select Library System</u> screen select the system you want to modify.
You are not modifying the library data. IMPRINT will make a copy of the analysis for you to use. Once you have saved it, the new analysis will appear on the <u>Open Existing Analysis</u> screen.
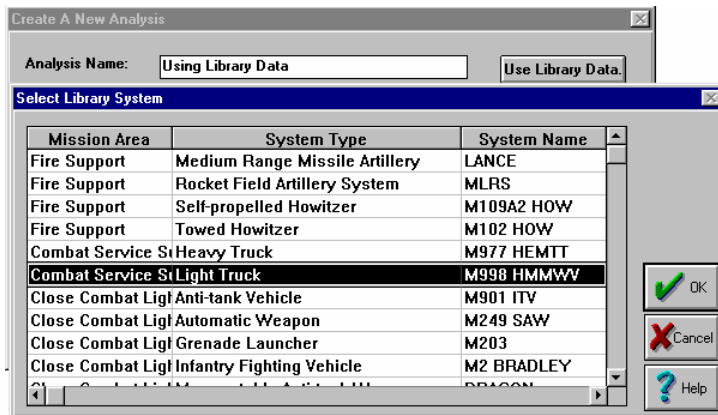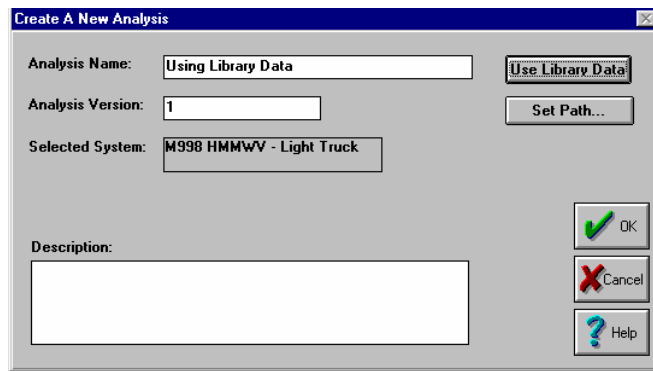
To see the complete list of IMPRINT's library systems see "IMPRINT Library Systems" on page 82.

Using Library Data

After you select the system select "OK" to get you back to the Create A New Analysis screen.

Because you selected a system stored in IMPRINT's library the "Selected System" field will be filled. This shows you the system name and system type. In this example the system name is "M998 HMMWV" and the system type is "Light Truck".

If you want to make some notes you can enter information in the "Description" field. When finished select OK. Now you are ready to make your modifications.

When you use the library model, the network has already been created and all the data that was required when the model was originally created has been entered. You can now make the necessary modifications to update the model so it will meet your requirements.

Network Tool Bar

The first icon is an arrow pointing to the upper left corner of the window. This is the select tool. When you click on this tool, and then click on an element in the diagram, the element will be selected. Selection is indicated by the element being highlighted. It can then be deleted, copied, etc. To open a network element, use the selection tool and double click.

The next icon is the down icon, which is represented by an arrow pointing down. This tool lets you go "down" into a function and open the child function's network of tasks and functions. You cannot go "down" into a task since tasks are terminal nodes and have no networks in them. Also, you cannot go down into a START or END function.

If you have gone "down" into a function, next is the up icon, which is represented by an arrow pointing up. Corresponding with the down tool, the up tool takes you to the parent function for the network currently displayed.

The path tool, represented by a right pointing arrow, is used to draw branches or paths between the nodes in your diagram. These nodes can be a mixture of functions and tasks. To draw a path, put the tool on the node you want to draw the path from and click. Hold the mouse button down while you drag the cursor to the node you want to draw the path to and then release the mouse button. If you draw more than one path from the same node, a decision diamond will automatically appear on your network diagram. Use the select tool and double click on the decision diamond to specify the branching logic associated with the multiple paths. (See "Decision Symbols" (page 77) for further explanation) Double clicking draws a path back to the current task.

To delete a path on your diagram, use the undo tool. The undo icon appears as a right pointing arrow that is made up of dotted lines. Follow the same procedure as with the path tool, and re-trace the path you want to erase. To erase a path that goes back to the same function/task, double click on that function/tasks.

The function tool, a rectangular icon, will add a function to your network. Just place the tool on the diagram at the place that you want the new rectangular function to be placed and click once. IMPRINT will not let you place a function on top of another network element.

The task tool, an oval shaped icon, works similarly to the function tool. Place the tool on the diagram at the place that you want to new task to occupy and click once. IMPRINT will not let you place a task on top of another network element.

The magnifying glass with a "+" sign and the magnifying glass with a "−" sign, let you zoom in and out of the network diagram. Select the tool and click on the network diagram. It will zoom in and out of the diagram view, letting you see more or less detail as it zooms.

The next four icons represent edit functions.

The first tool, scissors, is used to cut a highlighted function or task and place it on the clipboard. It can then be pasted to another area of the network.

The second tool, shown as two documents with an arrow between them, is used to copy a highlighted function or task and to put a copy on the clipboard so that it can be pasted elsewhere in your network.

The third tool is the paste tool, and is used to copy the data currently on the clipboard to the current cursor position.

The fourth tool, shown as a pencil eraser, is used to clear a network function or task. Data that are "cleared" cannot be pasted elsewhere in a network.

The final two tools are print functions.

The first tool, shown as two pages side by side, allows you to preview your network and along with File/Print Setup change your page orientation to landscape and reduce the size by going to the Graphics tab and reducing the Scaling %. However, you cannot access File/Print Setup while in Preview. Use Preview to check if the page layout is satisfactory. If not, then close Preview and then select File/Print Setup to make the necessary changes. Go back to Preview to ensure the page is the way you want it.

The second tool, shown as a printer allows you to print your diagram.

Decision Symbols

Probabilistic - (P)   ***Repeat -*** (R)   ***Multiple -*** (M)

Whenever you draw a path to more than one node you will get a "Probabilistic" symbol. If this is a "Probabilistic" node double click on the symbol and enter the probability for the functions/tasks that appear in the list on the "Function/Task Branching Logic" screen.

To create a "Repeat" node use the path tool:
(1) Draw your path to where you want the path to end when the function/task completes.
(2) Click on the node you want repeated; you will see the path come back to that node.
(3) Double-click on the "Repeat" symbol and enter the appropriate information on the "Function/Task Branching Logic" screen.

If you click within the node first and then draw your path to the other node you will see a "Probabilistic" symbol. That's ok, you can change it to a "Repeat" node.
To change the symbol to "Repeat", double click on the "Probabilistic" symbol and select "Repeating" on the "Function Branching Logic" screen and enter the appropriate information.

To change a "Probabilistic" node to a "Multiple" node double click on the "Probabilistic" symbol and select "Multiple" on the "Function/Task Branching Logic" screen. Then from the drop down menu select the node where your functions/tasks will rejoin.

PTS Impact on Tasks

Define System Mission

When you apply **P**ersonnel Characteristics/**T**raining Frequency/**S**tressors to your tasks, depending on the taxons associated with the tasks, not all tasks will be affected by **P/T/S**.

Below are tables that show which taxons are affected when you apply **P**/**T**/**S**. Because there are no entries for Time and/or Accuracy for some of these taxons, does not mean that there is no affect. What it does mean is there is no literature that could be found to validate a change.

T = Affects task time   **A** = Affects task accuracy   **T/A** = Affects both

*P*ersonnel Characteristics

Increase/decrease of ASVAB affects the following TAXONS:	
Visual	**A**
Numerical Analysis	**T/A**
Information Processing	**T/A**
Fine Motor – Discrete	**T/A**
Fine Motor – Continuous	
Gross Motor – Light	**A**
Gross Motor –Heavy	
Commo (Reading & Writing)	**T/A**
Commo (Oral)	**A**

*T*raining Frequency	TAXONS		
	Numerical	**Fine Motor – Discrete**	**Reading & Writing**
Less than twice a year	**T/A**	**A**	**T/A**
Less than once a month	**T/A**	**A**	**T/A**
Once a month (Default)	**T/A**	**A**	**T/A**
2 or 3 times a month	**T/A**	**A**	**T/A**
Once a week or more	**T/A**	**A**	**T/A**

TAXONS	**S**tressors				
	MOPP	**Heat**	**Cold**	**Noise**	**Sleepless Hours**
Visual	T	A	T		
Numerical Analysis		A			T/A
Cognitive Processing		A			T/A
Fine Motor - Discrete	T	A	T		
Fine Motor - Continuous					
Gross Motor - Light	T		T		
Gross Motor - Heavy					
Commo (Read & Write)		A			
Commo (Oral)	T	A		A	

Define Equipment

When you apply **P**ersonnel Characteristics/**S**tressors to your tasks, depending on the taxons associated with the tasks, not all tasks are affected by **P**/**S**.

***** **Note:** At this time IMPRINT does not have any reliable data to show how Training Frequency is affected.*

Below is a table that shows which taxons affect which maintenance tasks when you apply **P**/**S**. The taxons affect time only. When applied, the MTTR (mean time to repair) will change. At this time, there are no reliable data to show how Training Frequency is affected.

Taxon	*Repair Tasks*
Visual Fine Motor Discrete	Adjust & Repair
Visual Information Processing	Inspect
Visual Fine Motor Discrete	Remove & Replace
Visual Information Processing	Test & Check
Visual Information Processing	Trouble Shoot

Mapping Workload to Taxons

Mental Workload Ratings	Taxons
Visual 1.0, 3.7, 4.0, 5.0, 5.4, 7.0	Visual (Pattern Recognition-Discrimination
Cognitive 7.0	Numerical
Cognitive 1.0, 1.2, 3.7, 4.6, 5.3, 6.8	Information Processing
Psychomotor 2.2, 4.6, 5.8, 7.0	Fine Motor Discrete
Psychomotor 2.6	Fine Motor Continuous
---	Gross Motor Light
---	Gross Motor Heavy
Auditory 4.9, 6.6, 7.0 *Psychomotor* 1.0	Communications (Oral)
Visual 5.9 *Psychomotor* 6.5	Communications (Read & Write)
Auditory 1.0, 2.0, 4.2, 4.3	---

   ***Note* : None of the VACP workload scores map into either Gross Motor Light or Gross Motor Heavy taxons because workload channels are primarily mental

Define Equipment Exercise Data Sheet

Subsystem	EquipGrp	Component	Action	MaintType	Org Level	DS	Mos1	Grade	#Mos1	MOUBF	MTTR(Hrs)	SD MTTR(hrs)	Abort%
Armament	*Armament*	**Ejector Chute**	*Adjust & Repair*	Preventive	DS	Off	45G	10	1	150.00	00:01:30.00	00:00:00.00	0.00
			Remove & Replace	Corrective	Org	On	63E	10	1	150.00	00:01:30.00	00:00:00.00	0.00
		Ammo Chute	*Remove & Replace*	Corrective	Org	On	45K	10	1	100.00	00:02:00.00	00:00:00.00	0.00
			Trouble Shoot	Preventive	DS	Off	63E	10	1	100.00	00:02:00.00	00:00:00.00	0.00
		Recoil Mechanism	*Adjust & Repair*	Corrective	DS	Off	45K	10	1	11984.00	00:02:10.80	00:00:00.00	0.00
			Remove & Replace	Corrective	Org	On	45G	10	1	5136.00	00:00:49.20	00:00:00.00	0.00
		Barrel Assembly	*Adjust & Repair*	Preventive	Org	On	63E	10	1	300.00	00:00:36.60	00:00:00.00	0.00
			Remove & Replace	Corrective	Org	On	45K	10	1	300.00	00:00:36.60	00:00:00.00	0.00
Communication	*Other*	**Rec/Trans**	*Adjust & Repair*	Corrective	DS	Off	63E	10	1	679.00	00:01:13.80	00:00:00.00	0.00
			Remove & Replace	Preventive	Org	On	45K	10	1	679.00	00:01:04.80	00:00:00.00	0.00
		AM 1780 VRC	*Adjust & Repair*	Preventive	DS	Off	63E	10	1	611.00	00:02:15.00	00:00:00.00	0.00
			Remove & Replace	Preventive	Org	On	63E	10	1	203.00	00:01:45.00	00:00:00.00	0.00
		Communications	*Adjust & Repair*	Preventive	Org	On	63E	10	1	763.00	00:01:14.40	00:00:00.00	0.00
			Inspect	Corrective	Org	On	45G	10	1	763.00	00:01:14.40	00:00:00.00	0.00
Engine	*Mobility*	**Starter**	*Adjust & Repair*	Corrective	DS	Off	45G	10	1	851.00	00:01:48.00	00:00:00.00	50.00
			Remove & Replace	Preventive	Org	On	63E	10	1	1250.00	00:02:00.00	00:00:00.00	50.00
		Fuel Pump	*Adjust & Repair*	Preventive	DS	Off	63E	10	1	1893.00	00:10:24.00	00:00:00.00	100.00
			Inspect	Preventive	DS	Off	45K	10	1	1893.00	00:05:30.00	00:00:00.00	100.00
		Engine, Other	*Inspect*	Preventive	Org	On	63E	10	1	198.00	00:01:00.00	00:00:00.00	80.00
			Remove & Replace	Corrective	Org	On	45K	10	1	198.00	00:02:33.00	00:00:00.00	80.00

IMPRINT Library Systems

The library systems available in IMPRINT:

Mission Area	System Type	System Name
Air Defense	Air Defense Mobile Gun	M163VULC
Air Defense	HIMAD	Patriot FP
Air Defense	Man-portable Air Defense System	STINGER
Aviation	Attack Helicopter	AH-64A
Aviation	Cargo Helicopter	CH 47D
Aviation	Scout Helicopter	OH 58D
Aviation	Utility Helicopter	UH-60A
Close Combat Heavy	Cavalry Fighting Vehicle	M3 BRADLEY
Close Combat Heavy	Tank	M1 ABRAMS
Close Combat Light	Anti-Tank Vehicle	M901 ITV
Close Combat Light	Automatic Weapon	M249 SAW
Close Combat Light	Grenade Launcher	M203
Close Combat Light	Infantry Fighting Vehicle	M2 Bradley
Close Combat Light	Man-portable Anti-Tank Weapon	DRAGON
Close Combat Light	Man-portable Indirect Fire Weapon	M252 81MM
Close Combat Light	Rifle	M16A1
Combat Service Support	Heavy Truck	M977 HEMTT
Combat Service Support	Light Truck	M998 HMMWV
Fire Support	Medium Range Missile Artillery	LANCE
Fire Support	Rocket Field Artillery System	MLRS
Fire Support	Self-propelled Howitzer	M109A2 HOW
Fire Support	Towed Howitzer	M102 HOW